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FOREIGN DISEASES OF SOLANACEAE, IN PART
Notes on foreign diseases of Capsicum, Lycopersicon, Nicotiana
and Solanum and incidental notes on other Solanaceae

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These notes were prepared by going through various card files and literature indexes and through books and articles in this Division, in the Bureau of Plant Industry, Soils and Agricultural Engineering and in the Department library for items on diseases of the four genera, Capsicum, Lycopersicon, Nicotiana and Solanum. Incidentally a good many items on other genera in the Solanaceae were picked up during the course of the work and are included since the pathogens might affect one or more of the important crop genera if introduced.

Many of the notes concern rusts, all of which are obligate parasites, but others concern fungi in genera containing species which are secondary as well as species which are destructive parasites, still others concern fungi which are more or less superficial but which may be injurious by interfering with growth or by disfiguring, and still others probably are secondary only but may hasten decay of injured or rotting tissues and spread rot to unaffected tissues. In many cases data are inadequate to enable one to determine the economic status of the pathogen in regions where it occurs but even if that could be done one would not be able to predict with certainty what to expect from the pathogens on the varieties of hosts grown here and under our conditions.

There are several systems in use for naming bacteria. We have made no effort to follow any of them. Virus diseases are taken up as a group following the other pathogens. Attention is called to the fact that the approved spelling for the tomato genus is now Lycopersicon instead of Lycopersicum and that most peppers are in the species Capsicum frutescens, C. annum having been reduced to synonymy.

ACANTHOSTIGMA RUBESCENS Rehm., causes a leaf spot of Solanum hypoleucum, in Brazil. Asci clavate, 45-48 x 8-9 μ ; spores fusiform, 3-5 septate, 12-15 x 3 μ .

ACROMONIUM BONORDENII Sacc., on rotting potatoes and rotting wood in Germany; probably saprophytic only. Growth effuse, white, sporophores awl-shaped; conidia ovoid, acrogenous, 4-6 μ long.

ACROBELOIDES CUBAENSIS (Steiner) Thorne, nematode, was found infesting potatoes from Cuba.

ACROTHECIUM CAPSICI Turc., causes hazel-colored circular to oval depressed areas with brown margins on fruit of Capsicum frutescens in Italy and Puerto Rico.

ACTINOMYCES SPP., are named as responsible for different types of potato scab, especially in Germany.

ACTINOMYCES TOTSCHIDLOWSKII Serbinov, mentioned under Alternaria capsici-annui, attacks fruits of Capsicum frutescens in Rumania causing pale green or brownish discolored areas which gradually spread, tissue beneath drying up. Infected fruit finally dies, or in wet weather, wet rot sets in. The apex is attacked most often.

AECIDIUM SP., an undetermined rust infects leaves and fruits of Solanum melongena, in Madagascar.

AECIDIUM CANTENSIS Arthur, rust of leaves and petioles of Solanum tuberosum, in Peru. Aecial cups crowded in circular groups 0.5 cm. or more across. Aeciospores angularly globoid or ellipsoid, 16-21 x 20-23 mu, walls 1.5-2.5 mu, thickened above to 5-9 mu, minutely verrucose.

AECIDIUM CAPSICI Kern & Whetzel, see Puccinia capsicola.

AECIDIUM CESTRI Mont., mentioned under A. vestiae.

AECIDIUM HABUINGUENSE P. Henn., on leaves of Solanum melongena in India and Rhodesia and S. baumii, S. incanum, S. indicum, S. panduraeforme and S. supinum in South Africa. Pycnia epiphyllous, crowded at center of the spots, 100-130 mu diam., becoming brown. Aecia hypophyllous, closely crowded on rounded leaf spots 3-6 mm. diam. which are olive brown, yellow, or brown above and yellow or green beneath. Aecia short cylindrical 250-300 mu diam. Spores angular-globose or ellipsoid, subhyaline, 18-22 x 15-18 mu, wall 1 mu thick, delicately verrucose, almost punctate. Foregoing description based on that of Doidge, Henning's description gives spores as dark yellow, smooth, 18-22 x 17-21 mu.

AECIDIUM HISPANICAE Kern, Cif., & Thurston. Aecia in groups 1.5-4 mm. across, on Solanum rugosum in Dominican Republic. Aeciospores angularly globose to broadly ellipsoid, 17-21 x 19-27 mu, wall 1 mu, apex thickened to 3-7 mu, verrucose.

AECIDIUM MUNDULUM Jackson & Holway. Aecia of the rust scattered on leaves and stems of Solanum pulchellum in Chile. Aeciospores ellipsoid 18-21 x 25-31 mu, wall 1 mu thick.

AECIDIUM PAPUDENSE Jackson & Holway. Aecia aggregated in yellow spots on leaves of Solanum ranuncianatum in Chile. Aeciospores globose to ellipsoid 21-25 x 24-30 mu, wall 2 mu thick, verrucose.

AECIDIUM POECILOCHROMAE Jackson & Holway. Aecia in groups 4-8 mm. across on yellow spots on leaves of *Poecilochroma quitensis*, in Bolivia. Aeciospores globose to broadly ellipsoid, 19-25 x 25-32 μ , closely and minutely verrucose, appearing smooth, wall 1-1.5 μ thick.

AECIDIUM SOLANI Beeli, is a leaf rust of *Solanum* sp. in Belgian Congo.

AECIDIUM SOLANI Mont., a leaf rust of *Solanum pinnatifolium* and *S. valdivianum*, in Chile, is also reported (Seymour) on *Chamaesaracha nana*, *Physalis lanceolata* and *P. virginiana*, in North America, but not listed by Arthur's manual for U. S. and Canada. See *Puccinia solani*. Aecidia hypophyllous, no spotting, scattered or gregarious, angularly globose, yellowish.

AECIDIUM SOLANINUM Speg., on leaves of *Acnistus parviflorus* in Argentina. Aecia densely gregarious, very short, 400-500 μ diam.; aeciospores globose, 18-20 μ diam., var. *LEVE* Speg., on the same host in Argentina differs from the species in having smooth walls. See *Puccinia solanina* Speg.

AECIDIUM SOLANIPHILUM Speg., on leaves of *Solanum sordidum* in Argentina. Spots amphigenous, circular, 5-10 mm. diam., indistinct; aecia hypophyllous, densely crowded, hemispherical, 0.4-0.5 mm. diam., pale yellow; aeciospores pale golden, subglobose, 25-30 x 20-25 μ .

AECIDIUM SOLANI-UNGUICULATI P. Henn., is a leaf rust of *Solanum* sp. and *S. unguiculatum* in Abyssinia, Eritrea, Kenya. Spots dark yellow; aecia amphigenous, scattered but peridia gregarious, 0.2-0.3 mm. diam. Aeciospores subglobose to ellipsoid, acutely angular, 18-26 x 15-18 μ .

AECIDIUM TUBULOSUM Pat. & Gaill., is listed by Arthur as a synonym of *Puccinia paspalicola* (P. Henn.) Arthur but other work and reports make it seem possible more than one species is involved in reports of this rust of eggplant and *Solanum torvum* and related plants, from West Indies, Central and South America, India and Africa as well as United States. Description under *Puccinia tubulosum*.

AECIDIUM VESTIAE Neger, is a rust of leaves and green stems of *Vestia lycioides* and *V. chilensis* in Chile and Peru. Aeciospores said to be similar to those of *A. cestri* (I of *Uromyces cestri*, q.v.) spots yellow, peridia gregarious, up to 1 mm. long.

AECIDIUM WITHANAE Thuem., see *Puccinia atropae*.

ALTERNARIA BRASSICAE (Berk.) Sacc. f. *SOLANI* Fautr., forms irregular, grayish spots on living leaves of *Solanum nigrum*, in France. Conidia 7-9 septate, 110-116 μ long.

ALTERNARIA BRASSICAE var. *TABACI* Preissocker, was reported on *Nicotiana tabacum* in Rumania, no description seen.

ALTERNARIA CAPSICI-ANNUI Savul. & Sandu, shown by inoculations to be parasitic, usually follows *Actinomyces todschlidowskii* Serb. (See above, we do not know which spelling is correct) on chilli fruits (*Capsicum frutescens*), forming irregular gray, grayish-brown or grayish-black spots 2-6 cm. across, in Rumania. Conidia 32-82 x 7-21 mu.

ALTERNARIA RUGOSA McAlp., causes effuse velvety greenish-black or olivaceous spots on living tomato fruits in Australia. Conidia variable, usually 40-50 x 11-14, but up to 80 mu long, isthmi short.

AMBYOSPORIUM ECHINULATUM Oud., occurs on *Nicotiana tabacum* leaves in Holland. Growth gray-green; creeping hyphae hyaline, branching, septate; erect hyphae simple, non-septate, pale gray-green above; conidia elliptical or ovate, pale gray-green, 8-12 x 6-9 mu.

AMEROSPORIUM SOLANI Torr., occurs on dead stems of *Solanum tuberosum* in Madeira Islands. Pycnidia superficial, dark, 100-150 mu diam., conidia 23-27 x 3-4 mu, fusoid-oblong, curved, ends pointed. Setae stiff, 180-250 x 6-8 mu, non-septate, sooty.

ANTHOSTOMA SOLANICOLA P. Henn., in stems of *Solanum paniculatum* in Brazil. Perithecia in groups, dark; asci 80-110 x 25-30 mu; paraphyses filiform, 2 mu diam., numerous; spores ellipsoid, dark brown, 20-30 x 15-18 mu.

APHANOSTIGME SOLANI Syd., affects living leaves of *Solanum* sp. in Costa Rica. Perithecia hypophyllous, scattered, 120-280 mu diam.; asci 60-80 x 7.5-10 mu. Ascospores narrowly clavate 3-septate, hyaline, 12-18 x 3-4 mu, Paraphyses numerous, filiform, 1.5-2 mu thick, mucous.

APHELENCHOIDES HUNTI Steiner, nematode, was first found infesting bulbs of *Lilium tigrinum* from Japan, apparently responsible for numerous small decayed areas scattered through the tissues. It has since been found in a fruit of *Physalis ixocarpa* from Mexico, in roots of *Alstroemeria* sp. from England, *Ipomoea batatas* from Sierre Leone, and in *Zingiber* sp. rhizome from Peru.

APHELENCHOIDES SOLANI Steiner, nematode, was found infesting tubers of *Solanum tuberosum* from Cuba and apparently responsible for disfiguring lesions.

APPENDICULELLA ADELPHICA Syd., (a *Meliola* relative) occurs on *Solanum erythrotrichum* in Costa Rica.

ASCOCHYTA ARIDA McAlp., occurs in drooping leaves and in dry, dead stems of *Nicotiana glauca* in Victoria, Australia. Spots brown, dry, later perforated, often confluent and with minute black pustules; pycnidia orange-brown, 170 mu diam.; conidia not constricted, 17-19 x 4-4.5 mu.

ASCOCHYTA CAPSICI Bond.-Mart., forms spots 3-5 mm. across on both sides of living leaves of Capsicum frutescens, walnut brown with amber margin. Scattering pycnidia 120-160 μ diam. appear on upper surface only, in Orel section of Russia. Conidia one septate, sometimes bent, 8-10 x 3 μ .

ASCOCHYTA DUCOLETI Fourmont, causes irregular oval lesions on tobacco stems in France, the bark being raised, cracked and silver white. Other species of Nicotiana were inoculated successfully. Pycnidia brown, 100-230 x 75-220 (av. 140 x 125 μ). Conidia oblong or subcylindrical, continuous, later uniseptate, not constricted, 5.2-8.2 x 2.8-3.8 μ , average 3 x 7 μ .

ASCOCHYTA DULCAMARA Bub., occurs on leaves of Solanum dulcamara in Bohemia and Germany. Spots epiphyllous, rounded, at first dirty green, later almost black, 2-5 mm. diam.; pycnidia 100-150 μ diam., yellowish; spores 7-9 x 2-4 μ .

ASCOCHYTA NICOTIANAE Pass. (not Ell. & Everh.), irregular dull brown leaf spots on Nicotiana affinis and N. tabacum in France, Germany, Italy, Puerto Rico, Rumania, Russia and Sweden. Pycnidia in dried out spots, dark brown; spores ovoid-oblong, slightly constricted at septum.

ASCOCHYTA SOLANI Oud., in dry stems of Solanum tuberosum in Holland. Pycnidia somewhat roughened, 90-180 μ diam., spores ellipsoid, gelatinous at first, 14 x 7 μ , greenish.

ASCOCHYTA SOLANICOLA Oud., causes numerous brown spots 0.5-1.5 cm. across, obscure on lower side, in leaves of Solanum nigrum and S. dulcamara in Germany and Netherlands. Pycnidia epiphyllous, scattered, brown, 200 μ diam. Conidia one septate, without constriction, 10-12 x 2.5 μ .

ASCOCHYTA SOLANI-TUBEROSI Naumoff, affects living stems of potato in Russia, forming large, diffuse discolored spots often girdling and sometimes completely covering the stems. Pycnidia numerous, dark brown, 80-160 x 50-130; spores hyaline, ellipsoidal or cylindrical, variable, from 3-4 x 2 μ up to 7-12 x 3 μ , smaller spores 1-celled, larger 2-celled. Resembles Phoma solanicola Prill. & Delacr.

ASTERIDIELLA SOLANI McAlp., is reported on leaves, stalks and fruit stems of Solanum viride in New South Wales. Perithecia grouped, black, 130-330 μ diam.; asci usually 4-spored, 38-64 x 13-26 μ ; spores 4-septate, 36-44 x 14-15 μ . Pycnidia globose, golden brown, 100-140 μ diam.; spores 5.5 x 3-4 μ , subglobose to oval, hyaline or rarely brown. Mycelium amphigenous, forming black crusts.

ASTERINA, mentioned under Dimerium clemensiae and Saccardo-myces socius.

ASTERINA BALANSEANA Karst. & Roum., on wilted leaves of Solanaceae in French Indo-China. Perithecia gregarious in spots, dark, 60-80 μ diam., asci not seen; spores ovoid or subcuneate, sometimes colored, 13-18 x 7-9 μ .

ASTERINA CORRALOPODA Syd., is reported on leaves of *Solanum brachycyphum*, in Ecuador. Spots epiphyllous, 1-5 mm. diam., blackish; ascocarps 90-200 μ diam.; asci 28-40 x 25-35 μ ; spores 18-21 x 9-15.5 μ , 1-septate, variable, sometimes colored.

ASTERINA DIAPHANA Syd., on living leaves of *Solanum manucaling* in Mindanao, P. I. Perithecia hypophyllous, more or less grouped, 100-200 μ diam., dark; asci 35-55 x 35-42; spores oblong-ellipsoid, strongly constricted at septum, covered with hyaline mucus, 21-28 x 12-15 μ .

ASTERINA DILABENS Syd., is reported on leaves of *Solanum rugosum* and other plants, in Puerto Rico and occurs in Chile. Amphigenous, perithecia gregarious, 90-200 μ diam., dark; asci 22-26 x 18-24 μ ; spores ellipsoid, constricted at septum, 12-15 x 7.5-9 μ .

ASTERINA RECLINATA Syd., reported on leaves of *Solanum stelligerum* in New South Wales. Spots epiphyllous; ascomata closely scattered, 90-150 μ diam.; asci 2-8-spored, 26-38 μ diam.; spores oblong, little or no constriction, 18-21 x 8-11.5 μ .

ASTERINA SOLANICOLA Berk., & Curt., see *Dimerosporium* (Asterina) *solanicolum*.

ASTERINA SOLANICOLA P. Henn., on leaves of *Solanum leucodendron* in Brazil. Mycelium crustaceous, dark, forming minute spots; perithecia scattered, dark; asci 35-40 x 8-10 μ ; spores not constricted, hyaline becoming brown, 5-7 x 3.5-4 μ .

ASTERINA SOLANICOLOIDES Rehm., on living leaves of *Solanum* in Ecuador. Mycelium epiphyllous; perithecia 150-200 μ diam.; asci subglobose, 50-60 x 30-40 μ ; spores oblong or subovate, at first hyaline becoming somewhat brown, 20-25 x 9-12 μ .

ASTERINA SOLANI-TORVI Hansford, reported on leaves of *Solanum* sp., in East Africa.

ASTERINA SUBRETICULATA Speg., occurs on living leaves of *Solanum* and *Cestrum* in Brazil, sometimes associated with *Calothyrium leptosporum* q.v. Mycelial spots 1 mm. diam., dark; perithecia 100-150 μ diam.; asci 30-40 x 20-30 μ ; spores elliptical-obovate, 18-20 x 10 μ , constricted at septum, hyaline, becoming sooty.

ASTERINA VAGANS Speg., is reported on living leaves of *Solanum boerhaviaefolium* and *S. verbascifolium* in Brazil and *Solanum* sp. in North America (Seymour). Mycelial spots 0.5-1 mm. across; perithecia loosely scattered, 80-120 μ diam., asci 40 x 30 μ ; spores with little or no constriction, clavate or obovate 20-22 x 8-9 μ , little color.

BACILLUS (?) CAPSICI Pavar. & Ture., causes fruit rot and wilt of *Capsicum frutescens* in Italy.

BACILLUS CAULIVORUS Prill. & Delacr., is said to cause stem cankers on *Solanum tuberosum*, *Lycopersicon* and *Nicotiana tabacum* in Italy and France.

BACILLUS COLI-CAPSICI Pass., causes dry rot of apical part of fruits of Capsicum frutescens in Italy.

BACILLUS IXIAE Severini, causes browning and dying back of the tops followed by a soft rot of the bulb of Ixia maculata and also infects Crocus sativus, Gladiolus colvilli, Hyacinthus romanus and Solanum tuberosum, in Italy and Holland.

BACILLUS LEGUMINIPERDUM V. Oven, see Bacterium leguminiperdum.

BACILLUS MACULICOLA Delacr., causes a leaf spot of Nicotiana tabacum in Bulgaria, France, Greece, Rumania, and Switzerland. Said to be spread by Gnorimoschema holiopa in Greece.

BACILLUS (?) PUTREFACTIENS PUTRIDUS Delacr., is a soil saprophyte which sometimes destroys the pith of topped plants of Nicotiana tabacum, in France.

BACILLUS SOLANISAPRUS Harrison, causes a wilt and tuber discoloration and rot in potatoes and infects numerous unrelated hosts, in Canada. Reported in stored tubers in a warehouse in Brazil.

BACILLUS TABAGIVORUS Delacr., is reported as causing a collar rot of Nicotiana tabacum, in France, Bulgaria.

BACILLUS TUBIFEX Dale, causes irregular brown spots on leaves of Solanum tuberosum and Lycopersicon esculentum in Great Britain.

BACTERIUM BRIOSI Pavar., attacks leaves, stalks and fruits of Lycopersicon esculentum in France, Germany, Italy and Holland, affected leaves wither, new buds are deformed and long brown spots appear on stems. See B. lycopersici Burgwitz.

BACTERIUM (PHYTOMONAS) HETEROCEA Vzaroff, causes brown leaf spots on Nicotiana tabacum, in Russia, the better introduced varieties being especially susceptible. Carried by seed and soil.

BACTERIUM LEGUMINIPERDUM (V. Oven.) Stevens, in manual as Bacillus leguminiperdum under Pisum, causes small water soaked spots which may fuse and turn brown if spots are numerous, stunting growth of affected parts, on Lycopersicon esculentum, Lupinus sp., Phaseolus vulgaris and Pisum sativum, in Germany. BACTERIUM LYCOPERSICI Burgwitz and other bacteria reported as causing blossom end rot are probably synonyms of B. briosi according to Elliott. B. lycopersici is said to cause blossom end rot of tomatoes, peppers and eggplants in much of Europe, Dutch East Indies, Ivory Coast, South Africa and Uruguay.

BACTERIUM LYCOPERSICI VITIATI K. Bassalik & H. Strzalkowska, caused a watery rot of tomatoes in the markets of Warsaw, Poland.

BACTERIUM PSEUDOZOOGLOBAE Honing, is said to cause a black rust disease of leaves of tobacco in Dutch East Indies, Italy and Trinidad.

BACTERIUM PUNCTULANS Bryan, see B. tomato.

BACTERIUM (?) RUBEFACIENS Burr., is said to form rusty spots inside tubers, similar to those of sprain, in Solanum tuberosum in England, Scotland, Netherlands, Germany, and Rhodesia. Infections mainly from soil.

BACTERIUM (?) SUBERFACIENS Burr., "Corky bacteriosis", is a form of sprain or internal rust spot, in the vascular ring only, of tubers of Solanum tuberosum in England, Rhodesia. Lives over in soil and in infected tubers. Organism goes through stolons to new tubers.

BACTERIUM SYRINGAE var. CAPSICI Orsini, causes a malodorous soft rot of fruits of Capsicum frutescens in Italy. Fruits are attacked at any stage of ripening and in any part, though usually at the base of the peduncle. A single olive-brown spot on any unripe fruit may spread over whole fruit in 8 or 9 days. In nearly ripe fruits spots soften without change of color. Liquid usually accumulates and weights down the tip. Attack seems to occur in autumn after a cold wet spell.

BACTERIUM TOMATO Okabe, causes a leaf spot of Lycopersicon esculentum in Formosa. Spots on upper surfaces at first yellowish-brown and watersoaked, later blackish-brown, irregularly circular 1-3 mm. across, becoming papery with age and with a yellowish green halo. Spots often crowded. Starts on lower leaves first. B. punctulans Bryan, in U. S. and Canada and intercepted from Mexico is said to be a synonym.

BACTERIUM XANTHOCHLORUM Schuster, is a wound parasite of tubers of Solanum tuberosum in Germany, also infecting Campanula rapunculus, Daucus carota, Lupinus nanus douglasii, Nicotiana tabacum, Physalis alkekengi and Vicia faba. Causes slow wet-rot of potatoes; browning of leaves, and black spots on stems of Vicia; and a white rot of lupin and Physalis.

BLEPHAROSPORA CAMBIVORA Petri, see Phytophthora cambivora.

BIVONELLA LYCOPERSICI Pass., is reported on tomato stems in northern Italy. Perithecia solitary, scattered or few in a group, dark; asci numerous, cylindrical; spores ellipsoidal with 5 transverse and median longitudinal septa, olivaceous-hyaline, 15-20 x 7-10 mu.

BOTRYTIS CINEREA Pers., see under Sclerotinia fuckeliana.

BRACHYCLADIUM SPICIFERUM Bain., is reported as causing a fruit rot of Capsicum frutescens, watermelon and pumpkin in Cyprus. Spores 26-40 x 9-15, ellipsoid or obovate, 3-septate, not constricted, sooty-olivaceous from long spike-like nodes on conidiophores, (fungus described from France on wet woody fragment.)

BRACHYSPORIUM, mentioned under Helminthosporium spp.

BRACHYSPORIUM CAPSICI Hiroe & Watanabe, is one of the fungi involved in rots of pepper fruits in Japan, others being B. tomato (Ell. & Barth.) Hiroe & Watan., B. ovoideum Hiroe & Watan. and B. senegalense Speg., q.v. Spots variable in shape,

chestnut brown turning darker. Conidia 1-5 usually 3 or 4 septate, 12-49 x 7.4-14.5 μ m mostly 29-31 x 10-12 μ m, oblong-fusoid, usually slightly curved, rounded above, pointed below, outer locules pale, next brown, and central cell brownish-black.

BRACHYSPORIUM OVOIDEUM Hiroe & Watan., causes fruit rot of pepper (*Capsicum frutescens*) in Japan. Conidia 1-4 usually 3 septate, 16-29 x 10-17 μ m, mostly 20-24 x 10-13 μ m, ovoid, straight or curved, rounded at both ends, yellowish-brown, outer cells paler.

BRACHYSPORIUM SENEGALENSE Speg., causes a rot of pepper fruits (*Capsicum frutescens*) in Japan. Also infects rice, *Cynodon dactylon*, *Eleusine indica* and *Coix lachryma-jobi* var. *frumentacea*. Conidiophores 3-6 septate, base sub-bulbous, dark but clear, 209-300 x 6-8 μ m; conidia acrogenous, solitary, ellipsoid-fusoid, ends acute, 4-septate, slightly constricted, 22-28 x 10-12 μ m, outer cells hyaline, next olive, central olive-black. Described from fallen, nearly rotten stems of Gramineae in Senegal, Africa. Mentioned under *B. capsici*.

BRACHYSPORIUM TOMATO (Ell. & Barth.) Hiroe & Watan., mentioned under *B. capsici*.

CALOTHYRIUM LEPTOSPORUM Theiss., occurs on leaves of *Solanum* sp. in Brazil, sometimes associated with *Asterina subreticulata*. Sori epiphyllous, 2-3 mm. across; ascomata in each sorus densely crowded, 100-150 μ m across; asci short-cylindrical, 55 x 14 μ m; paraphyses slender, weak; spores hyaline, 10-12 x 3.5-4 μ m, upper cell short and broad, lower longer and cylindrical.

CEPHALOSPORIUM TABACINUM Van Beyma Thoe Kingma, was isolated from tissues of a diseased tobacco plant in England. Conidia sub-globular 4-8 x 2.7-3.7 μ m, mostly 5.3 x 3.3 μ m, uniting under moist conditions into heads 10-15 μ m in diam. Conidiophores non-septate, irregular, hyaline, 16-36 x 2-3.3 μ m.

CERCOSPORIA EGENULA Syd., forms distinct, scattering, irregular spots 2-8 mm. across on *Solanum panduraeformis* in Transvaal, South Africa. Conidia 1-4 septate, 30-70 x 3-4 μ m.

CERCOSPOREA, mentioned under *Helminthosporium lycopersici* Maublanc & Roger.

CERCOSPOREA ARATAI Speg., forms ashy-brown rounded spots 3-20 mm. across on inactive foliage of *Solanum glaucum* in Argentina. Tufts often epiphyllous, 30-40 μ m diam., loosely gregarious in center of spots. Conidia sometimes ellipsoid, continuous, 18 x 10 μ m; sometimes cylindrical, 2-3 septate, constricted at septa and 30-40 x 10 μ m; always greenish.

CERCOSPOREA BRACHYCLADA Syd., forms inconspicuous rounded brownish epiphyllous spots 4-10 mm. across on leaves of *Solanum tuberosum* in Brazil and of *S. umbellatum* in North America (Seymour). Conidia 2-8 septate, hypophyllous, 35-100 x 4-5 μ m, subhyaline or pale grayish.

CERCOSPOREA CAPSICI Marchal & Steyaert (not Hoald & Wolf), see *Cladosporium capsici*.

CERCOSPORA COSTERIANA Petr. & Cif., causes spots 1-5 mm. in diam. on living leaves of *Solanum verbascifolium* in Santo Domingo and Cuba. Conidiophores variable, usually hypophyllous. Conidia 1-7 septate, 22-90 (rarely up to 135) x 4-6 mu, narrow fusoid or clavulate, variable, pale gray-brown.

CERCOSPORA CRASSA var. *SOLANI-NIGRI* Massal., is a zonate leaf spot of *Solanum nigrum* in Italy and the Caucasian Mountains. Spots concentric, dried out, purple-olive border; conidia uniformly colored, 100-150 x 15-18 mu, point hardly 2 mu broad, 7-9 septate.

CERCOSPORA DULCAMERICOLA Holl., causes circular brown leaf spots on *Solanum dulcamara* in Hungary. Tufts amphigenous; conidia cylindric-clavate, slightly thickened below, 3-8-septate, hyaline, 70-150 x 3.5-5 mu, usually 80 x 4 mu.

CERCOSPORA FEUILLAUDICISI Sacc., causes grayish spots on leaves of *Solanum nigrum* in France and *S. melongena* in India. Spots subcircular or irregular, margin paler; conidia 3-5-septate, 40-50 x 5 mu, cylindric, straight, pale yellow.

CERCOSPORA FULIGINA Roldan, forms dark brown hypophyllous colonies on leaves of *Lycopersicon esculentum* in the Philippine Islands. No spots, but dark brown colonies of conidiophores form on underside of leaves. Conidia 15-118 x 3.5-5 mu, 1 to several septate.

CERCOSPORA HELICTERIS Syd., is reported on *Solanum torvum* in the Philippine Islands and Puerto Rico. First described on *Helicteres hirsuta* in P. I. Spots amphigenous, 1-4 mm. diam., olive green; tufts hypophyllous, concealed among leaf hairs; conidia cylindric, 3-6-septate, hyaline, 30-50 x 2.5-3.5 mu.

CERCOSPORA HETEROSPERMA Bres., occurs on leaves of *Solanum tuberosum* in Poland. Spots lacking; tufts hypophyllous, gray, tinted lilac; conidia hyaline, variable, 1-5-septate, 24-60 x 3-6 mu.

CERCOSPORA INCARNATA P. Henn., occurs on leaves of *Solanum* sp., in Brazil. Tufts hypophyllous, among hairs, pink; hyphae dark rose; conidia fusoid or clavate, 3-6-septate, flesh colored, 20-46 x 4-5 mu.

CERCOSPORA MELONGENAE Welles, causes irregular, then confluent, zoned, chlorotic areas on leaves of *Solanum melongena* in Philippines, Ceylon, Mauritius and reported from California in 1940; conidia 38-119 x 4-8 mu, average 75 x 7 mu, 3-12 septate, hyaline.

CERCOSPORA MODESTA Syd., forms irregular spots 1-6 mm. across on leaves of *Solanum* sp. in Costa Rica. Spots variable in coloring, zones and margins. Conidia elongate-clavate, clear gray-brown, 35-78 x 3-5 mu, septa several, indistinct.

CERCOSPORA NICOTIANAE Ell. & Everh., mentioned under *C. raciborski* & *Septoria nicotianae*.

CERCOSPORA NIGRESCENS Wint., forms dark grayish amphigenous

spots with a yellowish halo on leaves of *Solanum nigrum* in Portugal. Conidia 60-80 x 35.5 μ , 9-septate.

CERCOSPORA PUYANI Syd., forms distinct amphigenous more or less circular dirty yellowish-brown spots, at first 1-3 mm. across, later on up to 1 cm. across, sometimes confluent, margin more or less dark on leaves of *Solanum trachycyphum* in Ecuador. Tufts always epiphyllous. Conidia sub-cylindrical or slender obclavate, apparently 2-6 septate, 40-105 μ long, lower part 3-4 μ in diameter, subhyaline or pale greenish.

CERCOSPORA RACIBORSKI Sacc. & Syd., causes circular, brown to whitish zoned leaf spots on *Nicotiana tabacum* and *Solanum tuberosum* in Asia, Africa, Australia, East Indies, and is said to be a synonym of *C. nicotianae* E. & E. which occurs in tobacco growing states in the United States. Tufts hypophyllous; conidia hyaline, filiform, apex long-extended, 3-5-septate, 60-180 x 4-4.5 μ .

CERCOSPORA RIGOSPORA Atk., mentioned under *C. tozensis*.

CERCOSPORA SOLANICOLA Sacc. & Berl., causes subcircular epiphyllous brown leaf spots without a definite margin on *Solanum verbascifolium* in Australia and on *S. melongena* in India. Tufts dot-like, sooty-olivaceous; conidia rod-shaped, base acute, apex obtuse, 3-4-septate, cloudy, subhyaline, 40-60 x 4-5 μ .

CERCOSPORA SOLANI Thuem., forms small inconspicuous olive colored spots on living leaves of *Solanum nigrum*, *S. melongena*, and *Solanum* sp. in Portugal, India, Ceylon, Uganda, Mauritius, Brazil, France. Tufts amphigenous, densely gregarious, dark olive, broadly effuse, no spot but on dark part of leaf; conidia pale gray, 5-6-septate, 100-120 x 6 μ .

CERCOSPORA TOSENSIS P. Henn. causes circular then confluent dull brown spots on leaves of *Solanum biflorum*, *S. nigrum* and *Solanum* sp. in China, Costa Rica, Japan, New South Wales and Philippines. Tai thinks it a synonym of *C. rigospora* Atk. which occurs on *S. nigrum* in the United States. Tufts dark olive, hypophyllous; conidia fuscid or clavate, dark, 30-65 x 3.5-4.5 μ , 3-8 septa, little or no constriction.

CERCOSPORA TRICHOPIILA Stevens, is reported on *Solanum torvum*, *S. verbascifolium* and *Heliicteres jamaicensis*, in Colombia, Dominican Republic, Puerto Rico. Spots round, dry, 3-5 mm. diam.; conidiophores hypophyllous, yellow, among hairs; conidia 44-68 x 5 μ .

CERCOSPORA VENEZUELLA Chupp, forms amphigenous, irregular or rounded brown spots 3-20 mm. across with a chrome yellow margin about 1 mm. wide, on *Solanum argentum* and *Solanum* sp. in Venezuela and Brazil. Conidiophores short, almost lacking; conidia almost cylindrical, 30-50 x 2.5-3.5 μ , nearly hyaline, septa indistinct except when constriction occurs, sometimes persist on concolorous conidiophores.

CERCOSPORA WITHANIAE Syd., forms pale indefinite spots on leaves of *Withania somnifera* in South Africa. Tufts hypophyllous, gregarious, inconspicuous, 27-35 μ diam.; conidia clavate-filiform, 2-5-septate, pale olive or subhyaline, 35-52 x 2.5-3 μ .

CERCOSPORINA SCIADOPHILA Speg., forms rounded whitish or semi-transparent amphigenous spots 2-5 mm. across on leaves of *Solanum violiflorum* in Paraguay. Tufts epiphyllous, gregarious; conidia often 5-septate, 30-50 x 3 μ , hyaline.

CHAETONIUM BOSTRYCHODES Zopf., occurs as a secondary organism on rotting potatoes in Germany. Perithecia 340 x 220 μ ; asci clavate, 50 x 12 μ ; spores ellipsoid 6-7 x 5 μ , dark olive.

CHAETONIUM COCCODES Wallr., occurs on moldy stored potatoes in Germany; secondary. Description imperfect.

CHAETONIUM CRISPATUM Fekl., occurs on rotting potatoes in damp cellars in Austria and Germany (?) Perithecia gregarious; asci cylindrical, 82-100 x 10 μ ; spores more or less globose, hyaline, 12 x 10 μ .

CHAETONIUM CYMATOTRICUM Cooke, occurs on leaves of *Solanum dallachii* in North Queensland, Australia. Gregarious; perithecia 200 μ diam.; asci pyriform; spores globose-ovate, sooty, 10 x 8 μ .

CHAETONIUM STREPTOTRIX Quel., was described from pieces of dead potatoes in France. Perithecia minute, black; ascospores lemon shaped, brown, 12 μ long.

CHAETOTHYRIUM GUARANITICUM Speg., in living leaves of an undetermined species of Solanaceae ? in Brazil, no spots; perithecia on either leaf surface, scattered, 100-150 μ diam., dark; asci variable, 40 x 10 μ ; spores elliptical or sub-ovate, 10-14 x 4-5 μ , hyaline, little or no constriction at septum (may have 3 septa later?)

CHAETOTRICHUM SOLANI Syd., forms dark gray suborbicular hypophyllous spots 5-10 mm. across on living leaves of *Solanum* sp. in Costa Rica. Conidia obclavate-cylindrical 3-6-septate, 34-50 x 7-8 μ , dark.

CHEILOBUS RUSSI Pensò, is listed in a Rome, Italy publication as a new species of nematode parasitic on potatoes.

"CHOCOLATE", is the name given a new disease which affects potato tubers in Tucuman, Argentina, showing as a chestnut discoloration. (Possibly virus?)

CHRYSOCYCLUS CESTRI (Diet. & P. Henn.) Syd. (Syn. *Puccinia cestri* Diet. & P. Henn.) produces brown rust pustules on leaves of *Cestrum* sp. and *C. strigillatum*, in Bolivia, Brazil, Costa Rica, Cuba, Ecuador, Panama and Venezuela. Sori in concentric circles, younger ones bright orange-red (Kern). Telia hypophyllous on rounded brown spots, scattered, brown, then naked and yellow, about 1-2.5 mm. diam., waxy; teliospores subfusoid or

fusoid-clavate, hyaline to yellow, 60-100 x 11-16 μ , wall thin, stalk becoming up to 200 μ long, broad, persistent.

CHRYSOPHLYCTIS ENDOBIOTICA Schilb., in manual under Solanum, is a synonym of Synchytrium endobioticum, q.v.

CLADOSPORIUM, mentioned under Sporodesmium solani-variants.

CLADOSPORIUM CAPSICI (Marchal & Stayaert) Kovachevsky forms brown spots 3-5 mm. or more broad, often confluent, on leaves of Capsicum frutescens in Belgian Congo, Spain, Morocco, and Bulgaria. More or less similar to C. fulvum. An intermediate form between Cladosporium and Cercospora. Conidia cylindrical, 3-septate, hyaline, 50 x 5 μ , in Belgian Congo. Unamuno's description for Spain calls for amphigenous spots, brown to black, diffuse, 5-10 mm. diam.; conidia polymorphous, cylindrical, fusoid, 1-3-septate, yellowish-brown, 34.2-77.1 x 3.5-5.5 μ at broad basal part.

CLADOSPORIUM NICOTIANAE Oud., in decaying Nicotiana tabacum leaves in Holland. Conidia elliptical, 8 x 4-5 μ at first hyaline, later hazel, almost always 1-septate.

CLONOSTACHYS ARNUCARIA Corda var. COMPACTA Proust, on half rotten potatoes in Germany. Tufts dark gray; conidia unequally subovate.

CLYPEOLELLA SOLANI Theiss., on leaves of Solanum sp. in Brazil. Conidia 3-septate, 28-32 x 12-14 μ , middle cells brown, end cells hyaline and smaller; perithecia brown, 35-55 μ diam.; asci ovate-globose, 45-55 x 38-45 μ ; ascospores becoming chestnut-brown, 25-27 x 10-13 μ .

COLLETOTRICHUM ATRAMENTARIUM (Berk. & Br.) Taub., see under Sclerotium setosum.

COLLETOTRICHUM BIOLOGICUM Chaudhuri, a sclerotial fungus with black setae found on dying potato stalks in Germany. In cultures on potato extract agar innumerable black sclerotia and a few conidia 14 x 5 μ were produced. These germinated immediately and produced normal mycelium and conidia. In hanging drops the germ-tubes produced thick-walled dark chlamydospores before producing sclerotia. Mature sclerotia were 400-500 x 300-360 μ . On concentrated oat-meal agar acervuli 200-300 x 150 μ and sclerotia were produced, conidia averaged 22 x 3.5 μ and setae up to 130 μ long.

COLLETOTRICHUM MELONGENAE Averna, is said to cause irregular spots 1-3 cm. across on fruit of Solanum melongena in Brazil. Conidia 5.7-11.4 x 2.5-3 μ .

COLLETOTRICHUM MELONGENAE Lobik, forms grayish brown, oval, zonate spots up to 8 x 5 cm. in size on fruits of Solanum melongena in Russia. Acervuli more densely grouped toward margins, 115-198 μ diam. Conidia 18.9-25.2 x 4.2-4.6 μ . Setae occur marginally and centrally, grayish-brown, 1-3 septate, tapering, 49.4-108 x 4.9-6.6 μ .

COLLETOTRICHUM NICOTIANAE Averna, causes irregular confluent dark brown spots on stems and branches of Nicotiana tabacum in Brazil.

COLLETOTRICHUM TABACUM Boning, causes a serious anthracnose or stem and rib scorch of tobacco (Nicotiana rustica and N. tabacum) in Bavaria, also found in Prussia on plants grown from Bavarian seed. Spots round or irregular, brown, becoming almost white on young leaves and up to 1 cm. in diam. On older leaves spots are surrounded by a dark brown ring outside which a water soaked area may appear. Flowers, seed capsules, seeds, leaf veins, petioles and stems are affected, lesions elongated on the latter. Conidia 15-22 x 4-5 μ , setae 60-90 μ long.

COLLETOTRICHUM TABIFICUM (Hallier) Pethybr., see under Sclerotium setosum.

CONICTHURIUM COMITATUS Tassi, is reported on dry stems of Solanum jasminoides in Italy. Pycnidia scattering, 80-100 μ diam.; conidia 4.5-5 x 3 μ , ovate, hyaline becoming pale sooty.

CROMATIDIUM ULEAE Syd., leaf rust of Cyphomandra sp. in Brazil and Peru. Spots epiphyllous, yellow, 3-3 mm. diam.; telia hypophyllous, in groups at first rounded, becoming more or less confluent, 2-5 mm. across, often concentric, yellow-brown, filiform, up to 2.5 mm. long, 40-60 μ thick; teliospores cylindrical, yellow or yellow-brown, 45-60 x 4.5-6 μ , wall uniformly 1-1.5 μ thick.

CROSSOPSELA OPPOSITA Syd., is a leaf rust of Solanum theobromaeifolium in Ecuador. Uredia amphigenous, mostly epiphyllous, 3-5, occasionally up to 12, in a group, 150-300 μ diam. Urediospores broadly ellipsoid to ovate, wall subhyaline to pale brown, 1.5 μ thick; telia hypophyllous, 25-80 μ broad and up to 5 mm. long, dark brown; teliospores sometimes 28-35 x 9-12 μ , but more often up to 55 x 6-8 μ , pale to intense brown, wall 0.7-1 μ thick.

CRYPTODIAPORTHE HYSTRIX (Tode) Petrak and its conidial form, (Phomopsis tulasnei Sacc. and other names) are reported to occur in Europe on numerous hosts including Solanum melongena and S. tuberosum (on dead stems). Perithecia 480-640 x 240-480 μ ; asci clavate, 40-54 x 7-11 μ ; spores long-fusiform, two-celled, usually 15-20 x 2-3 μ , sometimes a little larger; may have evanescent short appendages. Name and measurements for the conidial stage are in dispute. In manual as Diaporthe longirostris, under Acer. See D. tulasnei.

CRYPTOSPORIUM HYPODERMIUM Auersw., forms small oblong black spots on small dead branches of Solanum dulcamara in Spain. Conidia crescent-shaped, both ends obtuse, hyaline, guttulate.

CUCURBITARIA DULCAMARAE (Kunze & Schm.) Fr., is reported on stems of Solanum dulcamara in Europe. Fuckel regarded

Diplodia dulcamarae, q.v., as the pycnidial stage. Perithecia black; asci cylindrical, more slender below, 150-160 x 12-14 μ ; spores oblong, 3-8 transverse septa, one longitudinal partition, usually irregular, 19-27 x 9-11 μ , rarely 35 μ long; paraphyses filiform.

CYPHELLA GIBBOSA Leveille, a small agaric, was described as on stems of *Solanum tuberosum* in France. Cup membranous, funnel-form, base swollen, cup 3-5 mm. high, stipes, 1-3 mm. long; basidia 4-spored, spores ovoid, hyaline.

CYTOSPORA NICOTIANAE Averna, is said to cause irregular yellow areas on stems of *Nicotiana tabacum* in Brazil.

DACTYLIIUM LYCOPERSICI Plowr., found on *Lycopersicon esculentum* in England is assumed to be unimportant.

DACTYLIIUM TENUISSIMUM Berk., found on *Solanum tuberosum* in England is assumed to be unimportant.

DASYSCYPHA CONCRISPATA Rehm., on dry stems of *Solanum tuberosum* in Bavaria. Ascomata closely grouped, disk flat, hyaline, 100-250 μ diam.; asci ovate-clavate, 30 x 8 μ ; spores sub-clavate, hyaline, 6-8 x 1.5-2 μ ; paraphyses few, filiform.

DENDRODOCHIIUM AFFINE Sacc., on dead stems of *Solanum tuberosum* in northern Italy and on *Sambucus* and *Pinus silvestris* in France. Sporodochia somewhat reddish, minute; conidia sub-ovoid, 3-5 x 2-2.5 μ , rosy-hyaline; sporophores filiform, fasciculate, sometimes 2-3-forked.

DENDRODOCHIIUM LYCOPERSICI Em. March., was found associated with *Phoma lycopersici* on fruit of *Lycopersicon esculentum* in Belgium. Sporodochia wart-like, 0.5-1 mm. diam., white becoming gray-black; conidiophores fasciculate, unequally divided; conidia 6-8 x 3-3.5 μ , ovoid or ellipsoid, hyaline.

DENDRODOCHIIUM ROSEUM Sacc., has been reported from France and northern Italy in rotting tubers of *Solanum tuberosum*, on stems of *S. nigrum* and on culms of spelt. Sporodochia scattering, 1.75-2 mm. diam., pale rose, smooth; conidiophores fasciculate, forked or cleft; conidia globose-ellipsoid, 4-5 x 2-3.5 μ .

DENDRYPHIUM (HELMINTHOSPORIUM) RHOPALCIDES (Pres.) Berl., (in manual under *Sodum*), is reported on weakened stems of *Lycopersicon esculentum*, *Solanum tuberosum* and other hosts in Europe and (according to Seymour) in North America. Growth effuse velvety, olive black; conidia cylindrical-clavate, 9-12-septate, 55-80 x 10-12 μ , dark brown, end cells sub-hyaline.

DIAPORTHE, mentioned under *Phlyctaena microscopica*.

DIAPORTHE ARCTII (Lasch) Nits., see under *D. Tulasnei*.

DIAPORTHE DULCAMARAE Nits. (this and *Phomopsis dulcamarae* stage are listed with different authors) occurs on darkened areas of dry stems of *Solanum dulcamara* in Denmark, England, France, Germany, Italy, Netherlands, Spain and Wales. Pycnidia gregarious, black; A-spores fusoid, 8-10 x 2-2.5 μ

(Grove) or 8-10 x 2 mu (Saccardo), this stage was named *Phoma dulcamarae* Sacc. (not Thuem.); B-spores filiform, hooked, 25 x 1.5 mu; perithecia scattered singly, 400-560 x 300-400 mu; asci clavate, 52-60 x 8-9 mu (Wehmeyer) or 60-80 x 10-12 mu (Nitschke); ascospores 1-septate, 12-14 x 3 mu sometimes up to 17 mu long and up to 5 mu wide (Wehmeyer), or 15-18 x 3.5-5 mu (Nitschke). Wehmeyer lists this as *D. sarothamni* var. *dulcamarae* (Nits.) Wehm.

DIAPORTHE LONGIROSTRIS Sacc., is a synonym of *Cryptodiaporthe hystrix*, q.v.

DIAPORTHE PAMPEANA Speg., occurs on dead stems of *Solanum glaucum* in Argentina and on *S. jasminoides* in Portugal. Pycnidia scattered, dark, 180-200 mu diam.; A-spores 6-8 x 2-3.5 mu, elliptical; B-spore description not seen; perithecia 200-250 mu diam., sooty olive; asci fusoid, 50 x 7-8 mu; ascospores 12-14 x 3 mu. (Imperfect stage names are *Phoma pampeana* Speg. and *Phomopsis pampeana* (Speg.) Trav. & Speg.)

DIAPORTHE PHASEOLORUM (Cke. & Ell.) Sacc., see under *Phomopsis capsici*.

DIAPORTHE SAROTHAMNI (Auers.) Nits. var. *dulcamarae* (Nits.) Wehm., see *D. dulcamarae*.

DIAPORTHE SOLANI-VERBASCIFOLII Speg., is reported on dry branches of *Solanum verbascifolium* in Argentina. Perithecia 100-200 mu diam.; asci subfusoid, 40-60 x 8-12 mu; spores 14-16 x 3-6 mu.

DIAPORTHE TULASNEI Nits., is reported on dead stems of *Solanum tuberosum* and numerous unrelated plants in England, France, Germany, Italy, Russia and Spain. This may be a synonym of *Cryptodiaporthe hystrix*, q.v., and is one of numerous species listed by Wehmeyer as a synonym of *D. arctii* (Lasch) Nits. Grove describes *Phomopsis tulasnei* Sacc., as having pycnidia densely scattered, each with small blackish halo, about 200 mu diam.; A-spores ovate-oblong, 7-9 x 2.5-3 mu; sporophores linear-acute, at length curved, 15-18 x 1.5 mu; B-spores filiform, curved or hamate, 20-27 x 1 mu, on short sporophores. Nitschke's description of the perfect stage (as given in Saccardo) has stromata effuse; perithecia small, scattered; asci oblong or clavate, 46-53 x 6-7 mu; ascospores fusiform, subhyaline, 10-14 x 3 mu. (According to Grove the A-spores on *Solanum* are *Phlyctaena maculans* Fautr., q.v.)

DIDYMELLA SUPERFLUA (Fekl.) Sacc. on dead stems of *Solanum* and other hosts in Germany, France, Great Britain and Italy. Perithecia scattered, dark, 150-200 mu diam.; asci clavate 62-65 x 12-13 mu, few paraphyses; spores subovoid-oblong 14-16 x 4-6 mu. Conidia of *Phoma* type, cylindrical, curved, minute.

DIDYMOPSCRA SOLANI Diet., is a leaf rust of *Solanum* sp. in Brazil. Pycnia epiphyllous; telia hypophyllous, aecidioid, 0.15-0.3 mm. broad. Teliospores 30-35 x 19-25 mu, ellipsoid,

pale yellow. (No aecia or uredia.)

DIDYMOPSIS SOLANI-ARGENTEI (P. Henn.) Diet., is a leaf rust of *Solanum argenteum* and *S. swartzianum* in Brazil. Telia hypophyllous, 0.2-0.25 broad x 1 mm. high; teliospores pale brown, 45-55 x 28-36 μ ; intercalary cells 14-20 μ high x 16-18 μ wide.

DIDYMOSPHERIA ? *SORDIDISSIMA* Speg., on rotting decorticated branches of *Solanum verbascifolium* in Argentina. Perithecia 100-150 μ diam.; asci cylindrical, 100 x 6 μ ; spores ellipsoid, 12 x 5 μ , constricted at septum, sooty.

DIDYMOSPHERIA WINTERI Niessl., in dead stems of *Solanum dulcamara*, *Lysimachia vulgaris* and *Spirea aruncus* in Austria. Perithecia scattered or loosely gregarious, minute, dark; asci clavate, 60-80 x 10-12 μ ; spores lanceolate or lanceolate-oblong, yellow-green or olivaceous, 11-14 x 4.5-5 μ .

DIMERIUM, mentioned under *Saccardomyces socius*.

DIMERIUM (*PHACOSTIGME*) *CLEMENSIAE* Syd., is parasitic on *Asterina* (sooty mold) on *Solanum torvum* in the Philippine Islands. Perithecia gregarious, 80-140 μ diam.; asci clavate-cylindrical, 38-48 x 12-15 μ ; spores oblong, dark brown, 12-15 x 4.5-6.5 μ .

DIMERIUM SACCARDIANUM P. Henn., on leaves of *Solanum* in Peru. Mycelial spots epiphyllous, dark, 1-2 mm. diam.; perithecia dark, 70-110 μ diam.; asci clavate, 40-50 x 7-10 μ ; spores clavate, constricted at septum, dark brown, 10-14 x 3.5-4 μ .

DIMERIUM SOLANI P. Henn., parasitic on *Meliola* on leaves of *Solanum grandiflorum* in Brazil. Growth epiphyllous, dark; perithecia gregarious in *Meliola* hyphae, dark, 60-100 μ diam.; asci clavate, 40-50 x 7-10 μ ; spores ovoid or ellipsoid, dark brown, 8-11 x 3-4 μ .

DIMEROSPORIUM GUARAPILENSE Speg., on living leaves of Euphorbiaceae and Solanaceae in Brazil. Epiphyllous; spots dark, 1-3 mm. diam.; perithecia 80-150 μ diam.; asci cylindrical or obclavate, 28-40 x 9-12; spores becoming 1-septate and constricted, 10-15 x 2.5-5 μ , hyaline when young, becoming greenish pale olive.

DIMEROSPORIUM (*ASTERINA*) *SOLANICOLUM* (Berk. & Curt.) Speg., occurs on *Solanum pseudoquina*, *S. boerhaviaefolium* in Brazil, Ecuador and Cuba. Perithecia 75-100 μ diam.; asci 50-60 x 12-14 μ ; ascospores become four celled, 12-15 x 4 μ , paraphyses branching. See *Sarcinella* (?) *solanicola*.

DIPLODIA CACAOICOLA P. Henn., listed in the manual on *Lycopersicon* has numerous synonyms, occurs on a wide variety of hosts and is more or less cosmopolitan. We have used *D. natalensis* Pole-Evans as the preferred name.

DIPLODIA DULCETARAE Fekl., occurs on dry branches of *Solanum jasminoides* in England, Finland, Germany, Portugal and Spain. Fuckel regarded this as the pycnidial stage of *Cucurbitaria dulcamarae*, q.v. Conidia variable, usually 22-25 x 12-15 μ .

DIPLODIA NATALENSIS Pole-Evans, see under D. cacaoicola.
DIPLODIA SACCARDIANA Fl. Tassi, is said to cause a drying of stems of Solanum jasminoides and is reported on Centaurea deusta, in Italy. Pycnidia scattered, 100-120 mu diam.; conidia 18-20 x 8-9 mu.

DIPLODINA CAPSICI Curzi & Barbaini, occurs on dry stems of Capsicum frutescens in Italy. Pycnidia 150-200 mu broad, 100-120 mu high, darker above; conidia one septate, 7.5-10 x 2.5 mu, hyaline.

DIPLODINA ? DEGENERANS Died., is reported on rotting fruits of Solanum melongena in the Philippines. Pycnidia densely gregarious, 450 mu diam.; conidiophores 5-8 x 1 mu; spores numerous, ovate-ellipsoid, becoming one septate, 5-6.5 x 2-2.5 mu, hyaline.

DIPLODINA LYCOPERSICOLA (V. Bond.) Mont., is said to cause large black spots on fruit of Lycopersicon esculentum in Russia. May be a synonym of Phoma destructiva Plowr. which is common in the United States.

DISCELLA DULCAMARAE Died., in dry branches of Solanum dulcamara in Germany. Pycnidia scattering, dark, up to 600 mu broad, 250 mu high; spores fusoid, not constricted at septum, 12-17 x 4.5-6 mu; conidiophores 15 x 1.5 mu.

DITYLENCHUS DIPSACI (Kuehn) Filipjev, in the manual as Tylenchus dipsaci Kuehn, under Narcissus, has been intercepted on numerous hosts from various countries, interceptions in potato tubers being from Belgium, Canary Islands, Danzig, England, Finland; France, Germany, Italy; Morocco, Netherlands, New Brunswick (Canada), Norway, Poland, Portugal, Prince Edward Island, Russia, Scotland, Spain and Sweden. This nematode is established in a number of areas in several states.
ELLISIELLA MUTICA Wint., was described as on living leaves of Silphium laevigatum (S. trifoliatum) in Missouri. F. MICROCHAETA Bresad. was described as on fruits of Solanum melongena in Kisanu Congo. Conidia falcate, fusoid, 25-30 x 3-3.5; conidiophores 20 x 3, cylindrical; bristles 50-150 x 3.5-7, septate, base bulbous.

ENDOPHYLLUM HOLWAYI Jackson, leaf rust with pycnia and brown aecidioid telia occurs on Salpichroa sp. in Bolivia. Telia aecidioid, hypophyllous, closely crowded in groups, 1-4 mm. diam.; teliospores 16-21 x 28-40 mu, catenulate, ellipsoid or oblong, wall thickened at apex, chestnut brown.

ENTOR(R)HIZA (SCHINZIA) SOLANI Faut., a smut of Lycopersicon esculentum, was described from France and later reported from South Australia also. Roots and base of stem involved, wilt and death resulting. The cells of the infected part of the stem are filled with more or less spherical spores about 10 mu in diam.

EPICOCCEUM PURPURASCENS Ehrb. var. TABACI Pass., occurs on Nicotiana tabacum leaves in northern Italy.
ERYSIPIE CICKRACEANUM DC., see under Oidium tabaci.

ERYSIPIE COLLENTIS (Wallr.) Grev., see under Oidium lycopersicum.
ERYSIPIE SOLANI Vanha, was reported on leaves of Solanum tuberosum in Bohemia, but was not described apparently.

ERYSIPIE TABACI Sawada, powdery mildew on Nicotiana tabacum in Formosa.

ERYSIPIE TAURICA Lev., in manual under Althaea, is often listed under the conidial stage name (Oidiopsis taurica) or as Leveillula taurica (Lev.) Arnaud. It is common on a wide variety of hosts, including Nicotiana tabacum, Solanum melongenum, Capsicum frutescens, in Europe, Asia, and Africa. The fungus has other synonyms also.

ERYTHROTECIUM CYBALARIIE Borzi, causes a common disease of cotton lint and seeds in the West Indies and also infects tomato fruits and cowpea (Vigna catjang). Reported from Africa. Ascospores 24-37 x 2-2.5 mu, arranged in bundles, usually 2 to 6, with intertwined appendages.

EUTYPA LUDIBUNDA Sacc., is a variable fungus which has been reported from U. S. and Canada as well as South America. F. solani verbascifolii Speg., was described from Argentina. Perithecia 180-200 mu diam.; that part of the ascus containing spores is more or less cylindrical, 50 x 6-7 mu; spores 10-12 x 2 mu, subhyaline.

FUSARIUM ENUBESCENS A. and v. Ov. (not Berk. & Curt. which has been reported in the United States), causes small black, sunken spots on fruit of Lycopersicon esculentum in Germany, Italy and Denmark.

FUSICOCCEUS RHINOSUM El. & Em. Marchal, was found affecting immature fruits of Lycopersicon esculentum in Belgium. Pycnidia gregarious, grayish-black, 0.5-1 mm. diam.; conidiophores filiform, 15-20 x 1-1.5 mu; spores oblong, hyaline, 8-11 x 2-3 mu; cirrhi elongate, filiform, pale.

FUSIDIOMUS DULCISARIE Grove, occurs on dry dead stems of Solanum dulcamara in England, Italy, Germany and Austria. Said to be an abnormal stage of Gibberella flacca Sacc. which in turn is said to be a form of G. saubinetii (Mont.) Sacc., which occurs in this country. Conidia 3-5 septate, faintly constricted, 30-40 x 4-7 mu.

GIBBERELLA, mentioned under Stagonospora dulcamarac.

GIBBERELLA FLACCA Sacc. and G. SAUBINETII (Mont.) Sacc., mentioned under Fusidomus dulcamarac.

GLIOCLADIUM NICOTIANA Oud., in rotting leaves of Nicotiana tabacum in Holland. Conidiophores 2 on a secondary branch, 16 mu long; conidia oblong, 8-10 x 3-4 mu glued together inside a gelatinous head 1.5 mm. diam.

GLCOPPEZIZA TERRICULA Sacc. & Peyronel, forms heavy reddish patches or crusts in tobacco seed beds in Italy, retarding germination and sometimes killing the seedlings. Ascomata densely gregarious, 250 μ high, 150 μ broad, brick red; asci 120-140 x 12-18 μ (part containing spores); spores ellipsoid, 14-18 x 9-12 μ . (Carpogonia and antheridia observed.)

GLOEOSPORIUM CAPSICI Unamuno, infects fruits of *Capsicum frutescens* in Spain. Acervuli whitish-yellow; conidiophores 25-32 x 5-6 μ ; conidia 18-23 x 6-7.5 μ .

GLOEOSPORIUM MOELLERIANUM Thuem., is reported on stems of *Capsicum frutescens* and other hosts in Portugal. May be another synonym of *Glomerella cingulata*. Acervuli scattered, dirty brown-purple; conidia rod-shaped to ellipsoid, 14-18 x 4-5 μ .

GLOEOSPORIUM NICOTIANAE Boning, a provisional name given an anthracnose of *Nicotiana rustica* in Germany. Conidia 8-18 x 2-5 μ .

GLOEOSPORIUM SOLANI Osterw., described as infecting fruits of *Solanum capsicastrum* in Switzerland is reported to infect *S. melongena* in the Caucasus, U.S.S.R. Acervuli often concentric, blackish; conidia cylindric, or ovoid-clavate, or curved, 13.5-17 x 3.6-4.8 μ or (in Ukraine (?)) 11-19.5 x 3.3-5.5 μ (Pidoplichka); conidiophores 19-31 x 2.4-3.05 μ .

GLOMERELLA CINGULATA Spauld. & Schrenk, mentioned under *Gloeosporium moellerianum*.

GNORIMOSCHEMA HELIOPA, insect, mentioned under *Bacillus maculicola*.

GRAPHIUM BGLIVERII Riofrio, occurs on injured, rotting *Lycopersicon esculentum* stems in Spain. Synnemata yellowish, up to 1 mm. long, 100-150 μ thick; head light orange, 250-300 μ diam.; conidia at first surrounded by mucus, ellipsoid or ovoid, 4.5 x 2.3 μ , rosy-hyaline.

GRAPHIUM FISSUM Preuss. var. *DULCAMARAE* Sacc., in branches of *Solanum dulcamara* in northern Italy and *Melia azedarach* in Argentina. Stalks cylindric, sometimes split, attenuate upward, spreading into a head at the apex; hyphae fasciculate, sooty, fertile at the ends in the head; conidia 7-8 x 2.5 μ .

GUIGNARDIA SP., probably undescribed, produces a firm black slowly developing rot of fruits of *Lycopersicon esculentum* in Trinidad.

GUIGNARDIELLA NERVISEQUIA (Rehm.) Sacc. & Syd., occurs on leaves of *Solanum* sp., *S. bifidum*, *S. argenteum* and *S. auriculatum* in Brazil and Ecuador. Perithecia epiphyllous, gregarious, sessile, dark, 250 μ diam.; asci oval, stalk 60 x 3 μ , spore bearing part 50 x 21 μ ; spores elliptic, one celled, hyaline, 15-20 x 7-9 μ , 3-rowed. Perithecia along nerves of leaves. (It may be noted that Clements and Shear carry this as

Vestergrenia and the key (p. 63) says "asci not long stalked," but 60 x 3 μ is longer than many asci have.)

HAINESIA LYCOPERSICI Speg., listed in the manual on leaves of Lycopersicon esculentum in Argentina was described as on nearly mature fruit. Spots orbicular, 0.5-2.5 cm. diam. or confluent, pale; acervuli closely aggregated in center of spot, hemispherical or ellipsoid 100-150 μ diam., often confluent, pale rose; conidia cylindric; conidiophores cylindrical, 15-20 x 5 μ with single spore, closely crowded.

HAPLOCYSTIS (?) VEXANS Speg., causes round, concave, withered blotches, 2-7 mm. in diam. with yellowish or dull gray concentric wrinkles on nearly ripe fruit, hyaline gum exudate common, on Capsicum grossum and Lycopersicon esculentum in Argentina. Sporangia cinnamon-colored, pear-shaped, 65-100 x 20-30 μ . Zoospores minute, globose, smoky-colored.

HAPLOSPORELLA SOLANI (Pass.) Sacc. in woody stems of Solanum sp. in Abyssinia. Pycnidia distinct; conidia oblong-ellipsoid, dark chestnut-brown, 14-16 x 8 μ ; paraphyses subclavate.

HELMINTHOSPORIUM SPP., on Lycopersicon, are in need of study. H. tomato Ell. & Barth., as described, has been intercepted on tomatoes from Mexico but seemed to be a Brachysporium. One or two other species, undetermined, have been intercepted from Mexico and from Haiti.

HELMINTHOSPORIUM LYCOPERSICI Maublanc & Roger, was described in 1936 as associated with a Cercospora in leaf spots on Lycopersicon esculentum in Ivory Coast, Africa. Conidia 7-14 septate, 90-200 x 10-18 μ , light brown or paler.

HELMINTHOSPORIUM LYCOPERSICI Roldan, was described in 1936 as causing brownish lesions 0.25-3 mm. in diam. on foliage of Lycopersicon esculentum in the Philippines. Pepper and eggplant said to be slightly susceptible. Conidia 4-12 septate, 50-107 x 10-18 μ , olive brown. Conidiophores hypophyllous, 70-145 x 7-9 μ .

HELMINTHOSPORIUM RHOPALOIDES Fres., in manual under Sedum, is a synonym of Dendryphium rhopaloides, q.v.

HELMINTHOSPORIUM SOLANI McAlp., occurs on leaves, petioles and stems of Solanum viride in New South Wales. Tufts amphigenous when on leaves, dark, minute, circular or irregular, often confluent; conidia dark brown, 4-septate, 36-44 x 14-15.5 μ .

HELMINTHOSPORIUM SOLANINUM Sacc. & Syd., causes leaf spots on Solanum argenteum in Brazil. Epiphyllous Helicium-like spots, dark, easily removed; fertile hyphae simple, non-septate, stiff, sooty; conidia cylindric, 3-septate, hardly constricted, brown, 18-22 x 4-4.5 μ , solitary, acrogenous.

HELMINTHOSPORIUM TOMATO Ell. & Barth., mentioned under Helminthosporium spp.

HENDERSONIA AMBIGUA Brun., occurs on dead stems of *Solanum dulcamara*, *Amelanchier* sp. and *Spiraea* sp. in France, *Solanum miniatum* in Spain, and is reported on *Alchemilla alpina* in the Arctic. Pycnidia more or less scattering, black; conidia oblong, yellowish-brown, 3-septate, 15-18 x 4.5-5 μ .

HENDERSONIA DULCAMARAE Sacc., in manual as *Phyllohendersonia dulcamarae* (Sacc.) Tass., on leaves of *Solanum dulcamara* in Italy. Spots dry, whitened, subcircular; pycnidia dark; spores cylindrical, 14 x 4 μ , not constricted, 3-septate, olivaceous.

HENDERSONIA DULCAMARAE Sacc. *F. JASMINOIDES* Gz. Frag., is reported on *Solanum jasminoides* in Spain. Spots dry, whitish, roundish; pycnidia dark; conidia oblong 16 x 7 μ , yellowish olive.

HENDERSONIA SOLANICOLA P. Henn., causes pale, rounded, dry spots on leaves of *Solanum* sp. in Sao Paulo, Brazil. Conidia 5-7 septate, variable, 15-28 x 5-6 μ , brown; pycnidia scattering 130-200 μ , dark.

HENDERSONULA AUSTRALIS Speg., a leaf disease of *Solanum boerhaviaefolium* in Argentina. Stromata rounded or confluent, closely scattered, epiphyllous; spots variable, dark, 0.5-1.5 mm. diam.; locules 80-90 μ diam.; conidia elliptic or fusoid, 2-3 septate, constricted, pale olive, 14-20 x 4-5 μ .

HETERODERA ROSTOCHILENSIS Wollenweber, which is a race of *H. schachtii* Schmidt according to Goodey, is a serious pest of potatoes in Europe. In 1941 this race was found infesting potatoes in an area of more than four hundred acres on Long Island. Whatever its taxonomic status it seems to be sufficiently distinct in its action on potatoes to be considered distinct for quarantine purposes.

HORMODENDRUM SOLANI (Oud.) Sacc., on dead stems of *Solanum tuberosum* and *S. nigrum* in Holland may be saprophytic. Conidia 20 x 5 μ , oblong-lanceolate.

HYALODERIA IMPERSPICUUM Speg., occurs on living leaves of Solanaceae and other hosts in Brazil, often with *Meliolas* or other fungi on which it might be parasitic. Hypophyllous, dark, radiating, hence producing brown spots; perithecia loosely gregarious, 60-80 μ diam.; asci few, up to 8-12, obovate, 40-45 x 12-18 μ ; spores fusoid-acicular, 30-38 x 2-2.5 μ , 4-septate, little or no constriction, second cell broader, hyaline.

HYPOCHNUS CENTRIFUGUS (Lev.) Tul., in manual under *Corchorus*, is said to be one of the perfect-stage names for *Sclerotium rolfsii* Sacc. which is destructive on many hosts, including Solanaceae, in the Southern states. Sclerotia scattered, 1-3 mm. long, hairy, subglobose; basidia ovate-elongate, 10-20 μ long, 2-4 sterigmata; spores ovoid, 5-7 x 3.5 μ .
IRENE, see *Irenina portoricensis*.

IRENINA GLABROIDES (Stevens) Stevens, a variable species or collection of species, is found on numerous diverse hosts,

including *Solanum persicifolium* and *S. rugosum* in British Guiana, Costa Rica, Dominican Republic, Ecuador, Panama, and Puerto Rico. Colonies amphigenous, 1-8 mm. diam.; perithecia 100-140 μ diam.; asci disappearing; spores 4-septate, brown, 41 x 17 μ .

IRENINA (MELICOLA) LAETA (Thiessen) F. L. Stevens, is reported on *Physalis* sp. in Brazil. Spots closely scattered, 2-3 mm. across, black; perithecia 220 μ diam.; black; asci 2-spored, 55 x 25 μ ; spores brown, cylindrical, 4-septate, slightly constricted, 48 x 17 μ .

IRENINA (MELICOLA) PLEBEJA (Speg.) Stevens, occurs on *Solanum rugosum* in Dominican Republic; on Solanaceae, Rubiaceae and Bignoniaceae in Brazil, Argentina, and Paraguay. Colonies 2-10 mm. diam.; perithecia 150-180 μ diam.; asci ellipsoid, 2-6-spored; spores cylindrical, 4-septate, sooty, 42-46 x 14-16 μ .

IRENINA PLEBEJA var. ASPERRIMA (Speg.) Stevens, occurs on *Physalis* sp. in Brazil. Asci not seen; spores 42-46 x 17-18 μ .

IRENINA (IRENE) PORTORICENSIS (Toro) Stevens, forms circular spots 0.5-1.5 mm. diam. on *Acnistis arborescens* in Puerto Rico. Perithecia 77-150 μ diam.; asci evanescent; ascospores brown, 4-celled (but illustration shows 4 septa), constricted at septa, 33-35 x 14-16 μ .

IRENINA (MELICOLA) SOLANICOLA (Hennings) Stevens, occurs on *Solanum* sp. in Africa. Colonies amphigenous; perithecia 120-180 μ diam.; asci oblong, 2-3-spored, 35-50 x 25-30 μ ; spores oblong-cylindrical, 4-septate, dark brown, 26-35 x 14-17 μ .

ISARIA FILAMENTOSA Sacc., in rotting stems of *Solanum* sp. in the botanical garden at Berlin, Germany may be secondary only. White, scattering or subgregarious; stromata often fasciculate, 1-1.5 mm. high; conidiophores cylindric-conic, 10-11 x 3.5; conidia oblong-ovoid, 5-8 x 2.5-3.5, hyaline, cloudy.

LAESTADIA MERII (De Not.) Sacc., is reported in dead stems of *Nicotiana tabacum* in northern Italy and Switzerland. Asci numerous, broad, oblong; spores oblong.

LEPTOSPHAERIA CIRCINANS (Fekl.) Sacc., in manual under *Asparagus*, occurs on roots of *Solanum tuberosum* and other plants in Italy, Russia and Germany. Perithecia somewhat scattering, black; asci terete-clavate; spores oblong-ovate, 3-septate, center cells brown-purple, end cells much smaller and hyaline, 32 x 12 μ .

LEPTOSPHAERIA SODOMAEA (De Not.) Sacc., is reported on dry stems of *Solanum sodomaeum* in Italy. Perithecia dark; asci oblong or clavate; spores oblong-fusoid, 5 celled, hyaline-yellow.

LEPTOSPHAERIA SOLANI Romell (not Ell. & Everh.), in stems of *Solanum dulcamara* in Sweden. Perithecia scattering 333 μ diam., black; asci terete-clavate, 75-85 x 9-11 μ ; spores oblong, 3-septate, some constriction, 14-16 x 6-7 μ , honey-olive.

LEPTOSPHAERIA UMBROSA Niessl., found on dry or withered stems

of various plants, including *Solanum dulcamara*, *Spiraea* and *Gentiana* in Germany. Perithecia small, black; asci 70-100 x 14-16 μ ; spores spindle-form, 4-septate, pale greenish becoming olive and often finally brown, 32-34 x 7-9 μ .

LEPTOTHYRIUM MICROSPORUM Sacc., on drooping leaves of *Solanum* in Brazil. Pycnidia epiphyllous, scattered, 0.5 mm. diam.; spores allantoid, 3-4 x 1-1.3 μ .

LEVEILLULA TAURICA (Lev.) Arnaud, see *Erysiphe taurica*.

LIMACINIA EXILIS Syd., causes inconspicuous spotting of living leaves of *Solanum trachycyphum* in Ecuador. Spots always epiphyllous. Perithecia solitary; 100-160 μ diam.; asci 35-45 x 13-17 μ ; ascospores 3-4-septate, hyaline, 18-23 x 4-5.5 μ .

MACROPHOMA NICOTIANAE Da Camara, occurs in stems of *Nicotiana tabacum* on St. Thomas Island in the Gulf of Guinea, Africa. Conidia 20-28 x 12-15 μ , oval subcylindric; pycnidia solitary or gregarious, dark, 250-350 x 200-270 μ .

MACROPHOMA TABACI Avena, causes irregular gray spots on stems of *Nicotiana tabacum* in Brazil.

MACROSPORIUM KOSAROVII Bubak, occurs on *Capsicum frutescens* in Bulgaria.

MELANOMMA MUTABILE Feltg., in dry stems of *Solanum dulcamara* in Luxemburg. Perithecia gregarious, dark, 300-400 μ diam.; asci terete-clavate or cylindrical, 47-73 x 6-8 (cylindric 91 x 6-8 μ), 6-8 spored; spores oblong-ellipsoid, 4-celled, constricted, pale olive-brown, 10-13 x 3-5 μ .

MELANOSPORA SOLANI Zukal, in tubers of *Solanum tuberosum* in Austria. Perithecia gregarious, yellowish, 160-200 μ high; asci broadly clavate, 30 x 25 μ ; spores short cylindric or almost cuboid, brown, 5-6 x 3-4 μ . Secondary only?

MELIOLA, mentioned under *Appendiculella adelphica*, *Dimerium solani*, *Hyaloderma imperspicuum*, and species of *Irenina*.

MELIOLA CAPSICOLA Stev., occurs on *Capsicum baccatum*, *C. frutescens*, in Dominican Republic, Ecuador, Puerto Rico. Colonies amphigenous, 1-3 mm. diam.; perithecia 170 μ diam.; asci evanescent; spores 4-septate, brown, slightly constricted, 41 x 14 μ .

MELIOLA SOLANI F. L. Stevens, on leaves of *Solanum jamaicense* in Puerto Rico. Colonies amphigenous, 2-4 mm. diam.; perithecia 150-180 μ diam.; asci disappearing; spores 4-septate, brown, 37 x 14 μ .

MELICLA WINTERII Speg., forms rounded colonies 4-6 mm. in diam. on leaves of *Solanum verbascifolium* in Paraguay. Perithecia 200-220 μ diam.; asci ellipsoid 65 x 30 μ , two spored. Ascospores 50-55 x 20 μ , 4-septate, elliptic-cylindrical, smoky.

MELIOLA WISMARENSIS Stev., forms black colonies 2-4 mm. across on *Solanum* sp. in British Guiana. Perithecia 150-185 μ diam.; asci two spored, evanescent. Ascospores 36-43 x 11 μ , 4-septate. *MELIOLA WISMARENSIS* var. *ANTILLANA* Ciferri, is parasitic on leaves of *Solanum antillanum* in Dominican Republic. Differs from the type in having a pale green halo; setae branching at the tips.

MELIOLA WISMARENSIS Stev. var. *PUYOENSIS* Syd., forms pale yellowish-brown discolorations on both surfaces of leaves of *Solanum campaniforme* in Ecuador. Perithecia 150-200 μ diam.; asci two or rarely three spored; ascospores oblong 4-septate, 30-34 x 11-12.5 μ , pale brown.

METASPHAERIA DULCAMARAE Massa, in branches of *Solanum dulcamara* in Italy. Perithecia gregarious, dark; asci numerous, clavate, 75 x 12 μ ; spores 3-septate, slightly constricted, 27 x 5 μ .

MICRODIPLODIA CAPSICI Sarejanni, causes well defined amphigenous whitish spots 2-3 mm. in diam. with light brown margins on living leaves of *Capsicum* sp. in Greece. Pycnidia few, scattering, black, 100-125 μ diam.; conidia one septate, 8-11 x 2-3 μ , not constricted, olivaceous.

MICRODIPLODIA OBSOLETA (Karst.) All., occurs on dead stems of *Solanum tuberosum* in Finland and Scotland. Pycnidia subgregarious, dark, 0.1-0.2 mm. diam. Conidia 7-11 x 2-3 μ , septum indistinct or none, oblong or subellipsoid, yellowish.

MICROPELTIS SUBAPPLANATA Speg., on living leaves of Solanaceae in Nicaragua. Perithecia scattered, 120-160 μ diam.; asci ovate, 50 x 30 μ , 5-8-spored; spores fusoid-cylindric, 3-7 septate, 20-32 x 4-5 μ .

MICROTHYRIUM CONFLUENS Pat., on leaves of *Solanum* and *Cestrum* in Ecuador. Perithecia confluent, 100-200 μ across; asci 45 x 16 μ ; spores clavate, 1-septate, 15 x 6 μ .

MICROTHYRIUM CRASSUM Rehm., on living leaves of *Solanum boerhaviaefolium* in Brazil. Perithecia gregarious, 0.5-0.8 mm. diam., often confluent, causing yellow spots on leaves; asci cylindrical or elongate-sacklike, 55-65 x 15 μ , cylindrical, up to 75 x 10-12 μ ; spores greenish-hyaline, not constricted at septum, oblong, rotund, 14-16 x 5 μ .

MICROTHYRIUM DISJUNCTUM Rehm., on living leaves of *Solanum* in Brazil. Perithecia in epiphyllous darkened spots, sometimes confluent, 4-7 mm. across, gregarious, 120-150 μ diam.; asci clavate, 45-48 x 10-12 μ ; spores clavate, upper cell usually rotund, lower acute, 10-12 x 4.5-5 μ .

MONASCUS RUBER Van Tiegh., on left over potatoes in France is saprophytic presumably. Mycelium effuse, conidia catenate; perithecia reddish-brown, 40-50 μ diam.; asci globose, sometimes 4, 8 or 10 spores each 11-16 μ diam., sometimes many spores, 7-8 x 4-5 μ .

MONILIA CEREBRIFORMIS, *M. MICROSPORA*, *M. DIVERSISPORA*, *M.*

MEDOACENSIS (Sacc.) Van Beyma thoe Kingma and M. MICROSPORA were all described by Van Beyma thoe Kingma, as causing mould of half or wholly manufactured tobacco in England. (*Monilia microspora* Speg., occurs on *Citrus aurantii* leaves in Brazil antedating the name above. Spegazzini's fungus has conidia 4-5 x 2.5-3 μ). Van Beyma thoe Kingma's fungi have conidia as follows: *M. cerebriforma*, 5.3-11.3 x 4.6-7 μ ; *M. macrospora*, 8-20 x 6-10 μ ; *M. diversispora*, some globular and 6-7 μ in diam., others 12 x 9 μ ; *M. medoacensis*, 6-12 x 4-8 μ mostly 8-9 x 7 μ , with double wall; *M. microspora*, 5-7 x 4-5 μ .

MONILIA PLATENSIS Speg., occurs on mature decayed fruit of *Lycopersicon esculentum* in Argentina. Conidia globose to elliptical, 6-10 x 6-8 μ , hyaline rose.

MONILIA TABACI Oud., in rotting leaves of *Nicotiana tabacum* in Holland. Spots snow-white, of variable size. Conidia globose or subellipsoid, 5 x 5 or 6 x 6 or 5-6 x 6-8 μ .

MONILIA TORENTOSA Van Beyma thoe Kingma like *M. cerebriforme* et al is a mould of half or wholly manufactured tobacco in England. Conidia 8-15 x 5-6 μ , elliptical.

MONILIOPSIS ADERHOLDI Ruhl., attacks tubers of *Solanum tuberosum* and kills seedlings of many plants including tobacco, in Europe and Java. The fungus forms black sclerotia similar to those of *Rhizoctonia solani* of which it might be a synonym. Pseud-conidia ovoid or variable, 15-30 x 11-17 μ , at first hyaline, later brownish; pseudosclerotia 1-3 mm. diam.

MOSAIC, see under Virus notes.

MYROTHECIELLA CATENULIGERA Speg., on rotting tomato stems in Argentina, presumably saprophytic. Sporodochia shield-shaped, 0.5-2 mm. diam., olivaceous with white margin; conidia cylindrical catenulate, 8-12 x 3 μ at first hyaline then greenish.

OEDOCEPHALUM NICOTIANAE Oud., on rotten leaves of *Nicotiana tabacum* in Holland. Conidia globose, 12 in each vesicle, 6-10 μ diam., olivaceous.

OIDIOPSIS TAURICA Salmon, see *Erysiphe taurica*.

OIDIUM LYCOPERSICI Speg., is reported to occur on tomatoes in Russia.

OIDIUM LYCOPERSICUM Cooke & Mass., is a powdery mildew of *Lycopersicon esculentum* in Czechoslovakia, England, Australia, Germany and apparently in Russia as Pidoplichka seems to consider it the conidial stage of *Erysiphe communis* (Wallr.) Grev. f. *solani lycopersici* Jacz. Hyphae short, branching, erect; conidia subglobose, in chains, 8-9 μ diam.

OIDIUM TABACI Thuem., in manual under *Nicotiana*, is considered a synonym of *Erysiphe cichoracearum*, one of our common downy mildews of numerous hosts, by Wolf. Conidia cylindric-ellipsoid, 11-14 x 4-5 μ .

OLPIDIASTER RADICIS (Willd.) Pascher, see *Olpidium brassicae*.

OLPIDIUM BRASSICAE (Wor.) Dang., in manual under Brassica, causes a collar rot of tobacco in North Caucasus (Russia) and occurs on various plants in Argentina, Great Britain, Morocco, Belgium, France, Finland, Germany, Hungary, Rumania, Russia, Sweden and is reported on strawberries in Utah and on lettuce in California. Olpidiaster radialis (Willd.) Pascher, in manual under Linum, is a synonym. Zoosporangia solitary or aggregated in host cell, spherical and 12-20 μ diam. to elongate and 25-220 x 20-45 μ ; zoospores uniciliate, 3 μ diam.; resting sporangia (cysts) usually spherical and 8-25 μ diam., but may be oval and up to 30 μ long; exospore coarsely wrinkled, ridges up to 3-5 μ high, showing a stellate pattern with 6-9 points in optical section; endospore thin, smooth, free from exospore.

OMPHALIA CRISPULA Quel., on rotting trunks of Solanum tuberosum in France. Shining white, diaphanous; cap thin, 3-4 mm. across, convex to flat, fimbriate, powdery; stalk 1 cm. high, powdery or pubescent; hymenium variable; spores ovoid, 8 μ long.

OOSPORA MEDOACENSIS Sacc., in fermenting leaves of Nicotiana tabacum in Italy. Colonies white, cottony to granular; conidia in short chains, easily separated, globose and 8 μ diam. or globose-ellipsoid and 8-9 x 7 μ , wall 1 μ thick, nucleus almost filling the spore

OOSPORA NICOTIANAE Pezz. & Sacc., on curing tobacco leaves in Italy & Sumatra, very injurious. Growth white; conidia in short chains or broken up or separated, globose, 2.5-3 μ diam., when separated becoming subellipsoid with both ends short papillate, (Listed by Wolf as Toruloidea nicotianae (Pezz. & Sacc.) Sumstine, causing "stack mold" of tobacco being air cured.)

OOSPORA PUSTULANS Owen & Wakef., in manual under Solanum, is probably rather widely distributed in the United States, even though distinct from Spongospora subterranea, as it undoubtedly has been brought in on numerous occasions in the past. OPHIOBOLUS FRUTICUM (Rob. & Desm.) Sacc. f. DULCAMARAE Feltg., occurs on dry stems of Solanum dulcamara in Luxemburg. Asci variable, up to 200 x 10-11 μ , often with long stalk. Ascospores 117-150 x 2.7-3.5 μ , up to 20 septate, unequally divided.

OPHIOBOLUS TENELLUS (Auersw.) Sacc., occurs on dry stems of Solanum dulcamara and Chelidonium major in France. Perithecia 250-333 μ diam. Asci 140 x 4-5 μ , ascospores filiform, 1 μ in diameter, yellowish or dark.

OPHIOBOLUS VULGARIS Sacc., reported on stems of Solanum nigrum and unrelated hosts in France and Italy. Perithecia 166-250 μ diam. Asci cylindric, 90-120 x 6-8 μ ; spores 30-100 x 1-1.5 μ , yellow.

OROBANCHE SPP. (flowering plants) are listed among parasites of Lycopersicon in Bombay Presidency, India.

OROBANCHE AEGYPTIACA Pers., occurs on tobacco in India and is serious on cucurbits and tomato and affects cabbage and

eggplant in Astrakhan.

OROBANCHE CUMANA Wallr., occurs on *Nicotiana rustica* in southern Europe, northern Africa, Asia Minor and India.
OROBANCHE MUTELI Schultz., occurs on tobacco in southern Europe and "Kapland."

OROBANCHE SCHWEINFURTHI Beck., is a parasite of tomato in Egypt.
PERIOLA TOMENTOSA Fr., on stored potatoes in Europe, secondary presumably. Rounded, white, often confluent, 4-6 mm. across; conidia obovate, 5 x 3 μ , conidiophores closely fasciculate. Makes entry of wet rot bacteria possible.

PERONOSPORA DUBIA Berl., on leaves of *Hyoscyamus niger* in Austria. Conidia broadly obovoid, 22-27 x 16-20 μ pale gray. Oospores unknown.

PERONOSPORA HYOSCYAMI DeBy., in the manual under *Nicotiana*, is the common blue mold or downy mildew disease of tobacco in the United States and is now known as *P. tabacina* Adam, q.v.

PERONOSPORA NICOTIANAE Speg., in manual as a synonym of *P. hyoscyami*, q.v., also see *P. tabacina*. It occurs on *Nicotiana longiflora*, *N. alpina* and other species in Argentina. Conidia ellipsoid or ovoid, 18-20 x 9-11 μ ; oogonia globose to angular, 80-100 μ diam., wall thick, hyaline; oospores single, globose, 50-80 μ diam.; epispore closely and regularly warted or areolate.
PERONOSPORA TABACINA Adam, in the manual under *Nicotiana*, is destructive on tobacco and occurs on related hosts in various parts of the world including the U. S. De Bary's description was of the conidial stage only, on *Hyoscyamus niger* in Germany and Great Britain. Conidia ellipsoid, 13-24 x 13-18 μ , wall pale violet. Adam described conidia of *P. tabacina* on *Nicotiana* spp. in Australia as 22 x 17 μ ; oospores 35-60 μ diam. with smooth or slightly roughened epispore. Bakhtin described the perfect stage of *P. hyoscyami* on *H. niger* in Russia as having oogonia 45-60 μ diam., globose or subglobose with a thin, non-persistent wall; oospores round or angular, yellowish-brown, 30-44 μ diam.; antheridia single, club-shaped, 30-35 x 16-20 μ . Clayton & Stevenson believe *P. tabacina* is the only species of *Peronospora* on *Nicotiana* and found the range of means of conidia to be 17 to 28 μ long by 13 to 17 μ broad and the size range of oospores about that of the genus, approximately 20 to 60 μ .

PEZIZELLA NECTRIELLA (Karst.) Saec., on dry stems of *Solanum tuberosum* in Finland, secondary presumably. Gregarious or scattered, sometimes confluent, pink, 0.3 mm. across; asci clavate 33-45 x 7 μ ; spores 6-7 x 1.5-2 μ .

PHAEOSTIGME, see *Dimerium* (*Phaeostigme*) *clemensiae*.

PHYLLOMYCES SCLEROTIOPHORUS Frank, is said to cause a scab and dry rot of *Solanum tuberosum* tubers in Russia and Great Britain.

May be a stage of *Spondyloccladium atrovirens* Harz. common silver scurf agent.

PHIALEA SOLANI (Pers.) Sacc., on rotting stems of *Solanum tuberosum* in Germany and Great Britain, presumably secondary only. Cups pale, stalked; asci linear, 52 x 4 mu; spores cylindrical, 8 x 2 mu.

PHLYCTAENA LYCOPERSICI Wor., on mature fruit of *Lycopersicon esculentum* in Russia (Caucasus area). Phomopsis connection not found. Spots brown up to 1 cm. diam., often confluent and hollowed out; pycnidia gregarious, 150-300 mu across, 50-70 mu high; spores 15-20 x 1 mu.

PHLYCTAENA MACULANS Fautr., on dry stems of *Solanum tuberosum* in France is said by Grove to be B-spores of the Phomopsis stage of *Diaporthe tulasnei* Nits. q.v. Pycnidia black; spores 35 x 1.5 mu; conidiophores fasciculate, 12 mu long.

PHLYCTAENA MICROSCOPICA F. Tassi, occurs on dead stems of *Solanum jasminoides* in Italy. Pycnidia dark, 333-500 mu diam. Conidia 13-20 x 0.5-1 mu. Phomopsis and Diaporthe connections not found.

PHOMA, mentioned under *Sporodesmium solani*-varians.

PHOMA ALTERNARIACEUM Brooks and Searle, causes a rot of both green and mature fruits of *Lycopersicon esculentum* in England, also isolated from rotting tomatoes from Holland. Swift considers the fungus a form of *P. conidiogena* Schnegg, another strain of which affects *Buxus sempervirens* var. *angustifolia* at the New York Botanical Garden. Pycnidia aggregated, dark, 100-250 mu diam. Conidia 3-7.5 x 2-3.5 mu, average 6 x 3 mu, tendrils rosy.

PHOMA BERKELEYI Sacc., see *Phomatospora berkeleyi*.

PHOMA CAPSICI Magn., see *Phomopsis capsici*.

PHOMA CAPSICI f. *CAULICOLA* Bianchi, in stems of *Capsicum frutescens* in northern Italy. Pycnidia gregarious, 100 x 6 mu, spores cylindrical; conidiophores about 10 mu long.

PHOMA CONIDIOGENA Schnegg, see under *P. alternariaceum*.

PHOMA DESTRUCTIVA Plowr., mentioned under *Diplodina lycopersicola* and *P. ferrarisii*.

PHOMA DULCAMARAE Sacc. (not Thuem.), see *Diaporthe dulcamarae*.

PHOMA DULCAMARINA Sacc., is said to occur on dry stems of *Solanum dulcamara* in Netherlands, Portugal, Spain, and is doubtfully reported on *Solanum* sp. in Kew Gardens, England. Pycnidia gregarious, black, small. Conidia 3 x 2 mu in description while in the English collection spores were 5 x 2.5 mu.

PHOMA EUPYRENA Sacc., in stems of *Solanum tuberosum* in France. Pycnidia somewhat gregarious, 250 mu diam.; spores ovoid, 4 x 1.5 mu.

PHOMA FERRARISII Cif., in manual under *Lycopersicon*, is now recognized as a synonym of *P. destructiva*, common in U. S.

PHOMA FOVEATA Foister, causes heavy losses of stored potatoes in Scotland, northern Ireland, Great Britain. The discoloration and texture of affected tissues varies, light brown, slightly watery, somewhat mealy, later salmon-pink with a little gray, then tissues shrivel, become dry and friable, dark grayish-pink, gray, or black, full of cavities lined with whitish mycelium. Pycnidia 105-309 x 110-418 (av. 177 x 187 μ). Conidia 3.2-7.7 x 1.1-2.1 μ , (average 5.7 x 1.7 μ), oblong or ovoid, rarely 1-2-septate, Chlamydospores dark brown, in chains.

PHOMA HERBARUM West. var *DULCAMARICOLA* Bubak, in dead branches of *Solanum dulcamara* in Montenegro. Pycnidia 240-300 μ diam.; conidia 6-8 x 2.5-3.5 μ .

PHOMA LYCOPERSICI Cooke, mentioned under *Dendrochium lycopersici*. *PHOMA NICOTIANAE* Maubl., occurs on leaves of *Nicotiana tabacum* in France. Pycnidia black, 150-200 x 75 μ , conidia 5-6 x 2.75 μ ; sporophores 8-10 x 1 μ .

PHOMA PANPANA Speg., see *Diaporthe panpeana*.

PHOMA PLATENSIS Speg., occurs on fallen fruit of *Solanum elaeagnifolium* in Argentina. Pycnidia 333-500 μ diam., dark. Conidia 5-8 x 2-3 μ , elliptic; conidiophores 15-20 x 1 μ .

PHOMA SOLANICOLA Pril. & Delacr., causes irregular white or yellowish spots which turn brown, on stems and branches of *Nicotiana tabacum*, *Solanum melongena* and *S. tuberosum* in Brazil, England, France, Ireland, Greece, Germany, Iceland, Italy, Lithuania, Netherlands and Spain. Seymour lists for North America on *S. tuberosum*. Grove thinks *P. tuberosa* Melh., Ros. & Sch. in U. S. may be the same species. Leaves wither when the diseased areas are extensive. Pycnidia gregarious, 135-145 x 110-115 μ ; spores ovoid, 7.5 x 5 μ . In England Grove found pycnidia 100-120 μ diam. and spores mostly 5-8 x 2-3.5 μ . Mentioned under *Ascochyta solani-tuberosi*. *PHOMA SOLANOPHILA* Oud., occurs on fruits and stems of *Solanum melongena* and *S. nigrum* in Belgium, Netherlands and Philippines. Pycnidia loosely gregarious, 140-160 μ diam., black; spores ellipsoid, 5-7 x 2-3 μ .

PHOMA SOLANI-LYCOPERSICI Fautr. & Roum., (not Cooke), occurs on old living fruits of *Lycopersicon esculentum* in France. Pycnidia irregular, black. Conidia 6-10 x 4 μ , ovoid or oblong. *PHOMA TABACI* Camara, Oliveira & Gomes, is reported on *Nicotiana tabacum* in Portugal.

PHOMA TUBEROSA Melh., Ras. & Sch., see under *P. solanicola*.

PHOMATOSPORA BERKELEYI (B. & Br.) Sacc. (and pycnidial stage, *Phoma berkeleyi* Sacc.) is reported on dead stems of several unrelated hosts including *Solanum jasminoides*, in Austria, Spain, Scotland, Germany, Denmark, Italy. Listed in Saccardo 1:432 as in North America, but Grove lists Germany, Denmark, Italy and Britain only. Listed on *Andropogon* sp. by Seymour. Conidia 8-10 x 2 μ .

PHOMOPSIS, mentioned under Phlyctaena lycopersici and P. microscopica.

PHOMOPSIS ALMEIDAE Trav. & Spessa, occurs on dead stems of Solanum nigrum in Portugal. Pycnidia scattered or subgregarious, 0.75-1 x 333-500 mu, dark; conidiophores 10-15 x 1-1.5 mu; conidia oblong ovoid or fusiform, 7-9 x 2-3 mu.

PHOMOPSIS CAPSICI (Magn.) Sacc., in manual under Capsicum as occurring on harvested fruit of C. frutescens in Italy and the Philippines, has been intercepted from Cuba and Mexico. Tucker studied a Phomopsis rot of pepper fruits in Missouri which Wehmeyer determined as belonging in the composite species Diaporthe phaseolorum (Cooke & Ellis) Sacc. of which P. capsici may be a synonym or strain. Spots gray, irregular; pycnidia scattered irregularly, 200-250 mu diam.; spores allantoid, 7-9 x 2-3 mu; conidiophores 20-22 mu long (Tucker considered the latter to be measurements of the B-spores.)

PHOMOPSIS DULCAMARAE (Sacc.) Trav., see Diaporthe dulcamarae.

PHOMOPSIS PANAMA (Speg.) Trav. & Speg., see Diaporthe panama.

PHOMOPSIS TUBERIVORA Gussow & Foster, causes a hard stem-end rot of potatoes in British Columbia, Canada. Pycnidia variable black, 0.25-0.5 x 1-2 mm.; conidia fusiform 7-13 x 4-6 mu on conidiophores 15-18 x 1.5 mu, septate at base; stylospores found once on a diseased tuber, once in culture, filiform 8-30 x 0.5-1.5 mu.

PHOMOPSIS TULASNEI Sacc., see Cryptodiaporthe hystrix and Diaporthe tulasnei.

PHYLLACHORA FLUMINENSIS Theiss., produces shiny black stromata 350-450 mu across, 250-340 mu high on brown leaf spots on Solanum sp. in Brazil. Ascospores 12-14 x 8 mu.

PHYLLHENDERSONIA DULCAMARAE (Sacc.) Tass., synonym of Hendersonia dulcamarae, q.v.

PHYLLOSTICTA AETHILIS Speg., causes spots 0.5-3 cm. across, rounded or ellipsoid, dirty ash-colored, sometimes bounded by a line of purple, on weakened leaves of Solanum glaucum in Argentina. Pycnidia 40-50 mu diam. Conidia 4-7 x 1-1.5 mu, cylindrical.

PHYLLOSTICTA ARATAE Speg., on living leaves of Solanum glaucum in a damp meadow in Argentina. Spots brownish-gray or yellowish-gray, center intensely colored, rounded, concentrically roughened, 0.5-2 cm. diam.; pycnidia 90-100 mu diam., dark; spores elliptic-cylindrical, 7-10 x 3-4 mu.

PHYLLOSTICTA CAPSICI Speg., causes circular grayish leaf spots 2-10 mm. diam., with definite deep brown margins on Capsicum sp. and C. frutescens in Argentina. Reported from West Virginia in 1928. Pycnidia epiphyllous, near center of spot, 80-90 mu diam., black; spores elliptic-cylindric, 7-8 x 3.5-4 mu.

PHYLLOSTICTA CAPSULICOLA Sacc. & Speg., occurs on capsules of *Nicotiana tabacum* and *N. dilatata* in Italy and *N. rustica* in Hungary and Ukraine (Russia). Spots indistinct or lacking; pycnidia gregarious, 70 x 100 μ , spores ovoid, curved, 7-11 x 3-4.5 μ .

PHYLLOSTICTA CONCENTRICA Theiss. (not Sacc.), on *Solanum* sp. in Brazil. Spots rounded, 0.5-2 cm. diam., more or less confluent, gray, margin a wavy line or faintly zoned concentrically, above; lower side blackish, edges indistinct, sometimes with yellow-brown zones; pycnidia in 2-7 concentric rings, 100 μ high and 160-180 μ broad; spores fusoid-oblong, 16 x 2 μ . (P. concentrica Sacc. infects *Nedera* and occurs in this country.)

PHYLLOSTICTA DULCETARAE Sacc., in the manual under *Solanum*, causes brown leaf spots, often marginal, on *Solanum dulcamara* in France, Italy, Denmark, Austria, Crimea and Ontario; on *S. carolinense* in Indiana, Missouri, and on *S. rostratum* in Kansas. Pycnidia epiphyllous, scattered, 80-90 μ diam.; spores globose-ellipsoid, 5-6 x 3 μ .

PHYLLOSTICTA HAINAENSIS Frag. & Cif., is supposed to be a conidial stage of *Sphaerulina hainaensis* Frag. & Cif., q.v.

PHYLLOSTICTA NICOTIANICOLA Speg., causes ashy amphigenous leaf spots 1-10 mm. diam. on *Nicotiana acutiflora* in Argentina. Center of spot becomes whitish. Pycnidia epiphyllous, 75-80 μ diam.; spores subcylindrical, 6-10 x 2 μ .

PHYLLOSTICTA PSEUDO-CAPSICI Roum., on leaves of cultivated *Solanum pseudo-capsicum* in France. Spots yellowish-white, subcircular-crooked, often with a tawny margin; pycnidia amphigenous, dark; spores ellipsoid, 8-10 x 4, subhyaline.

PHYLLOSTICTA SCIADOPHILA Speg., rather frequent on leaves of *Solanum violifolium* near Asuncion, Paraguay. Spots amphigenous, at first yellowish, becoming grayish-white, 2-8 mm. diam., rounded, often surrounded by a pale area; pycnidia epiphyllous, loosely gregarious, 90-100 μ diam., black; spores cylindrical-elliptical, 4-5 x 2 μ .

PHYLLOSTICTA SORDIDA Speg., on living leaves of *Solanum sordidum* in Argentina. Spots amphigenous, subcircular, 2-5 mm. diam., gray, definite, surrounded by a dirty brown band; pycnidia epiphyllous near center of spot, dark, 100 μ diam.; spores subcylindrical, 6-8 x 2 μ .

PHYLLOSTICTA TABACI Pass., causes irregular, often confluent, ashen-colored leaf spots on *Nicotiana tabacum* in France and Italy, is reported from Brazil, Germany, Hungary, Poland, Rhodesia, Rumania, Russia, Serbia, South Africa and in Seymour for North America. Often sterile; pycnidia dark; spores ovoid, 7 x 3 μ .

PHYSALOSPORA SOLANICOLA P. Henn., forms rounded, pale, dried-up spots on leaves of *Solanum* sp. in Sao Paulo, Brazil. Perithecia loosely gregarious, dark, shiny, about 140 μ diam.; asci

clavate, 55-60 x 18-20 mu. Ascospores oblong or ellipsoid, 13-17 x 7-9 mu.

PHYTOMONAS HETEROCCEA Vzoroff., see *Bacterium heteroceae*.

PHYTOMONAS (PSEUDOMONAS) POLYCOLOR Clara, causes a wet rot of seedlings and on older plants causes white or opaque or sometimes brown and zonated spots, sometimes with a narrow yellow halo, on *Nicotiana tabacum* in the Philippines. Seed borne. (Laboratory mice and guinea pigs died in 12 hours and rabbits in 24 hours after inoculation with this organism. It may be identical with *Pseudomonas aeruginosa* (Schroeter) Migula.)

PHYTOPHTHORA ALLII K. Saw., see *P. parasitica*.

PHYTOPHTHORA ARECAE (Colem.) Pethybr., listed in the manual under *Palmae* as capable of attacking potato tubers is, according to Tucker, a synonym of *P. palmivora*, under *Palmae* also. Other synonyms are *P. carica* under *Ficus*; *P. faberi* under *Theobroma*, *Orchidaceae* and *Palmae*; *P. fici* under *Ficus*; and *P. meadi* under *Hevea*. Apparently none of these affect *Solanaceae* except when artificially inoculated. Sporangia 38-72 x 33-42 mu averaging 50 x 35; zoospores 8-10 mu after coming to rest. Oospores spherical, 35-45 mu diam. with wall 4 mu thick. However, measurements vary greatly from these, in some hosts.

PHYTOPHTHORA CAMBIVORA Petri, reported to attack *Solanum tuberosum* in Italy, is in the manual as *Blepharospora cambivora* Petri under *Castanea*. The disease on chestnut is present in the southern states. Zoosporangia lemon-shaped, 40-54 x 60-75 mu. Zoospores ovoid, 12-15 mu across. Oospores 20-27 mu in diam. Measurements by different workers vary considerably from these.

PHYTOPHTHORA CAPSICI Leonian, see under *P. hydrophila*.

PHYTOPHTHORA CARICA (Hara) Hori, see *P. arecae*.

PHYTOPHTHORA CRYPTOCEA Pethyb. & Laff., which causes a damping off of seedlings of *Lycopersicon esculentum*, *Petunia* sp. and other plants in Great Britain, Australia and Denmark is destructive on cultivated marigolds (*Tagetes* sp.) in New York and on China-aster (*Callistephus chinensis*), annual stocks (*Matthiola incana* var. *annua*) and Transvaal daisy (*Gerbera jamesoni* var. *transvaalensis*) in California. Zoosporangia inverse-pyriform, 24-50 x 17-30 mu. Zoospores 10-15 mu in diam. Oogonia 30 mu diam. Oospores about 25 mu in diam.

PHYTOPHTHORA ERYTHROSEPTICA Pethybr., in manual under *Solanum*, causes a wilt of *Solanum tuberosum* plants and a moist rot of tubers in Ireland, Switzerland, Holland, Isle of Jersey, and Dutch East Indies, also in Maine, Mass., and La. Cut surfaces of infected tubers turn pink and after a few hours become purplish-brown to black. Diseased tubers remain firm but sort of rubbery and later rot completely. A strain of the fungus attacks *Atropa belladonna* in Poland. Zoosporangia 32 x 20 mu

sometimes papillate, chlamydospores lacking; oospores 29-30 μ . Measurements by various workers vary considerably.
PHYTOPHTHORA FABERI Maubl., see under *P. arecae*.

PHYTOPHTHORA FICI Ven., see *P. arecae*.

PHYTOPHTHORA HYDROPHILA Curzi, causes a foot rot of *Capsicum annum* in Italy. It has been listed as a synonym of *P. capsici* which occurs in the U. S. Zoosporangia lemon-shaped, 30-60 x 22-36 μ , larger when formed in water. Oospores (seen from cultures only) globose, 24-29 μ in diam., walls dark brown. Curzi measurements given; those by other workers vary greatly.

PHYTOPHTHORA MEADI McRae, see *P. Arecae*.

PHYTOPHTHORA MELONGENA K. Saw., in manual under *Solanum*, is a synonym of *P. parasitica* which is in the manual under *Ricinus* and which occurs rather widely in the U. S. Sporangia papillate, variable, 24-72 x 20-48 μ ; zoospores 10-11 x 8 μ ; oogonia in cultures 18-23 x 20-24 μ ; oospores 17-21 μ diam. (from Sawada description.)

PHYTOPHTHORA MEXICANA Hotson & Hartge, said to cause a rot of fruit of *Lycopersicon esculentum* in Mexico and to attack other plant parts, has not been adequately studied. It may be a synonym of *P. parasitica* which is quite variable. Sporangia 16-33 x 16-77 μ , papillae prominent; chlamydospores intercalary, 28-44 μ diam.; oospores 24-37.5 μ diam., wall 4.4 μ thick.

PHYTOPHTHORA NICOTIANAE v. B. de Haan, in manual under *Nicotiana*, is now called *P. parasitica* var. *nicotianae* (Breda de Haan) Tucker, q.v. Breda de Haan's description was incomplete and unsatisfactory.

PHYTOPHTHORA PALMIVORA Butler, see *P. arecae*.

PHYTOPHTHORA PARASITICA Dastur., in manual under *Ricinus*, occurs in this country on various hosts including *Capsicum frutescens*, *Lycopersicon esculentum*, *Solanum melongena* and *S. tuberosum* and in other countries on tobacco. *P. melongena*, q.v., in manual under *Solanum*, is a synonym, as is *P. allii*, in manual under *Allium*. Fungus variable. Dastur gave sporangia as 25-50 x 20-40 μ ; zoospores 8-12 x 5-8 μ ; oogonia 18-25 μ ; chlamydospores 20-60 μ diam.

PHYTOPHTHORA PARASITICA var. *NICOTIANAE* (Breda de Haan) Tucker, in manual as *P. nicotianae* under *Nicotiana*, causes damping off of tobacco seedlings and attacks leaves, stems and roots of older plants; often destructive. Reported from Argentina, Borneo, Brazil, Bulgaria, Ceylon, Cuba, Formosa, Germany, Gold Coast, Guatemala, Jamaica, Japan, Java, Mauritius, Nyasaland, Philippines, Poland, Puerto Rico, Rumania, Sumatra, Trinidad, Uganda and Alabama, Florida, Georgia, Kentucky, North Carolina, Tennessee and Virginia. The disease is known as black shank. The variety is similar to the species morphologically but differs in being destructive on tobacco.

PHYTOPHTHORA VERRUGGOSA Alcock & Foister, causes tomato toe rot (root rot) in Scotland. Sporangia inversely pyriform or oval, non-papillate, 31-56 x 24-36 μ , averaging 41.5 x 29.5 μ , no pedicel, germination by zoospores. Oogonia 23-47, averaging 37 μ in diam. Oospores 17-31, averaging 24 μ in diam. *PIONNOTES SOLANI-TUBEROSI* (Desm.) Sacc., found in stored potatoes with a wet rot, all over France. Sporodochia wart-like, convex, light yellowish-gray; conidia numerous, fusiform, straight or slightly curved, 3-5 septate, 30-35 μ long.

PLACOSPHERA NICOTIANAE Averna, is said to cause irregular dark-brown or black patches at bases of stems of *Nicotiana tabacum* in Brazil.

PLACOSTROMA AUSTRALIS (Speg.) Theissen & Syd., occurs on living leaves of *Solanum boerhaviaefolium* in Argentina. Conidia brown, 4-celled, 12-18 x 5-6 μ . Stromata epiphyllous, dark, 3-6 mm. diam.; asci 65-75 x 10 μ ; ascospores hyaline, 2-celled, upper cell broader, 16-18 x 6-7 μ . Younger loculi with numerous brown 4-celled conidia 12-18 x 5-6 μ .

PLATYSTOMUM DULCAMARAE Kirschst., on dry stems of *Solanum dulcamara* in Germany. Perithecia scattered or gregarious 300-400 μ diam., dark; asci clavate, 135-160 x 15-18 μ ; spores irregularly fusoid, often somewhat triangular, 9-11-septate transversely and constricted, incompletely septate longitudinally, honey yellow, 24-28 x 7-8 μ .

PLEOSPORA ALTERNARIA Gib. & Giff., a seed borne wound parasite, causes considerable damage at times to seedlings and plants of tobacco in Italy, Dalmatia and Galicia. On nearly mature leaves spots are brownish becoming reddish later. Macroconidia 26-68 x 10-15 μ , microconidia small and one-celled. Asci 34-70 μ , ascospores oval, muriform.

PLEOSPORA PRICESIANA (Bagn.) Sacc., occurs on stems and peduncles of *Solanum patulum* in Italy. Perithecia numerous, ovoid; asci clavate-fusoid; spores oblong fusoid, sub-7-septate, muriform, tawny-yellow, 35-40 x 10-12 μ .

PODOBELONIUM DULCAMARAE (Feltg.) Sacc. & D. Sacc., in dead stems of *Solanum dulcamara* in Germany, is secondary presumably. Ascomata scattered, shield-shaped, stalk powdery white 800-1200 x 200 μ , gradually broadened upward; disk orange, margin thin, outside smooth, yellow; asci long clavate, 62-70 x 5-7 μ ; spores fusoid, cylindric, often with a filiform appendage, 10.5-15.5 x 2.5-4 μ .

POLYSACCOPSIS HIERONYMI (Schroet.) P. Henn., in manual as *Urocystis hieronymi* Schroet., occurs on *Solanum* sp. in Argentina, Bolivia and Brazil and is called potato smut by Zundel. According to Zundel, gall like swellings on stems, young branches and in leaves are 3-5 cm. long, 1.5-2.5 cm. wide, covered by a yellowish membrane which soon ruptures exposing the spores which are borne in cavities formed by mycelium.

Spore balls usually have a central fertile cell enclosed by a layer of sterile cells. Spore balls 28-41 μ diam.; spores globose to ellipsoidal or irregular, chestnut brown, mostly 22-26 μ long, smooth; sterile cells close pressed, globose to ellipsoidal, tinted brown or hyaline, usually 9-13 μ long, smooth. Berries are infected also. According to Schroeter the spore balls are 22-40 x 22-30 μ ; central cell 16-26 x 15-20 μ and sterile cells 7-12 x 6-8 μ . The fungus intercepted on potatoes from Venezuela in 1932 and noted in the "List of Intercepted Plant Pests" for the period July 1, 1932 to June 30, 1933 (pp. 2 and 63) as *P. hieronymi* was not this fungus. An article on the fungus is to appear within a year and may be summarized then.

POLYSCYTALUM SACCARDIANUM Brizi, in fermenting fruit of *Lycopersicon esculentum* in Italy. Mycelium hyaline; conidia cylindric, 6-12 x 3-5 μ , hyaline.

POLYSTOMELLA PULCHERRIMA Speg., on living leaves of *Solanum boerhaviaefolium* and *Rubiaceae* in Brazil. Stromata epiphyllous 0.5-2 mm. diam., dark; asci cylindrical-obclavate, 50-70 x 12-15 μ ; spores 1-septate, little or no constriction, 13-16 x 5 μ .

PROTEUS MADSONII Lobik, causes a bacterial rot of tubers of *Solanum tuberosum* in Russia, infected tissue turning brown with a dark violet line between it and healthy tissue. Later cracks and heavy brown liquid exudes. *Lycopersicon esculentum* affected also.

PSEUDOMONAS AERUGINOSA (Schroeter) Migula, see under *Phytomonas aeruginosa*.

PSEUDOMONAS POLYCOLOR Clara, see *Phytomonas polycolor*.

PSEUDOMONAS SOLANIOLENS Paine, is said to cause brown scabby patches on tubers of *Solanum tuberosum* and an internal browning, in Europe. Inoculations with the organism failed to produce the general symptoms. Further study is needed on the causes of internal browning in Europe and U. S.

PUCINIA ACNISTI Arth., is a leaf rust of *Acnistus* sp., *A. aggregatus*, and *A. arborescens*, in Bolivia, Dominican Republic, Costa Rica, Peru and Trinidad. Aecia amphigenous, scattered or somewhat grouped. Aeciospores 16-19 x 19-27 μ , finely and closely verrucose. Telia mostly epiphyllous, scattered, shining, blackish-brown. Teliospores 19-24 x 27-35 μ , wall uniformly 2.5-3 μ thick, pedicel yellowish, somewhat fragile. For *P. nicotianae* Arthur, a synonym, measurements are given as aeciospores 13-18 x 16-19 μ ; teliospores 19-24 x 31-40 μ , wall somewhat thicker above, finely and sparsely verrucose.

PUCINIA ADDUCTA Arth., on leaves of *Solanum racemosum* in Antigua, West Indies. Pycnia epiphyllous in small round groups, dark brown, conspicuous, 80-105 μ diam.; uredia hypophyllous in pale spots 2-5 mm. across, scattered, cinnamon-brown, ruptured epidermis conspicuous; urediospores broadly ovoid, 27-35 x

19-23 μ m; telia mixed with uredia; teliospores ellipsoid or oblong, 35-40 x 19-26 μ m, little or no constriction at septum, cinnamon-brown, pedicel short, broad, usually fragile.
PUCCINIA AFRA Wint., on Lycium afrum near Cape Town, South Africa, Aecia usually crowded on sepals and peduncles which are thickened and distorted, wide open, 500-600 μ m diam., margin of peridium deeply incised, pale yellow; aeciospores globose to ellipsoid, contents deep orange, 29-34 μ m diam. or up to 48 μ m long and 21-24 μ m broad, wall hyaline, about 2 μ m thick, finely and closely verrucose; urediospores in sori with teliospores, oblong, yellow-brown, wall rather thick, 52-66 x 20-28 μ m; telia amphigenous, rarely on sepals, not forming spots on leaves, usually scattered, 0.5 mm. diam., dark brown; teliospores ellipsoid, with cone-shaped apicule, dark reddish brown, apicule lighter, 38-54 x 22-30 μ m, wall about 5 μ m thick, pedicel thick, hyaline, with vesiculous inflation at base.

PUCCINIA ARAUCANA Diet. & Neg., produces yellow and brown rust sori on deformed leaves and branches of Solanum sp., S. cyrtopodium, S. lycioides and S. valdivianum in Argentina, Bolivia and Chile. Aecia 200 μ m high, 15-30 μ m diam., white; aeciospores oblong or ellipsoid, 21-30 x 15-20 μ m, orange; telia dark brown, small; teliospores elliptic or oblong, 32-45 x 20-28 μ m, slightly constricted, brown, pedicel long (up to 140 μ m), slender upper part tinged brown.

PUCCINIA ATROPAE Mont., on Withania somnifera Dun. in South Africa, Abyssinia, Canary Islands, East India. The host is a common weed in cultivated land in Africa, Mediterranean region and India, in subtropical areas. Aecia hypophyllous or on thickened petioles, peduncles and calyces, in circular clusters on leaves, sometimes cover surface of infected parts, cylindrical, up to 1 mm. long and up to 500 μ m diam., margin of peridium white; aeciospores angular-globose, 16-28 x 14-20 μ m, wall thin, contents yellow; telia on stems, numerous, giving a blistered appearance, sometimes confluent, black; teliospores ellipsoid, or variable, little or no constriction, 30-45 x 17-25 μ m, rarely up to 70 μ m long, light chestnut-brown, wall 2.5-3.5 μ m thick, smooth; pedicel thin, hyaline, deciduous, up to 100 μ m long. Three-celled teliospores not uncommon. Close association indicates Accidium withaniae Thuem. is aecial stage.

PUCCINIA AULICA Jackson & Holway, is a leaf and stem rust of Solanum montanum in Ecuador. Telia in subhypertrophied areas 0.2 mm. in diam. Teliospores 19-25 x 26-35 μ m, not constricted at septum, wall 1-1.5 μ m thick, apex thickened, up to 5 μ m, pedicel hyaline, fragile, variable, often deciduous, up to 100 μ m long.

PUCCINIA CAPSICI Mayor, is a leaf rust of Capsicum sp. in Brazil and C. baccatum in Colombia. See P. capsici Avena-Sacca. Telia hypophyllous, rarely epiphyllous, on brown spots up to 5 mm. diam., dark chestnut-brown; teliospores ovate-ellipsoid, 28-35 x 16-21 μ m, pale brown, not constricted.

ed, wall 2 μ thick; stalk hyaline, persistent, up to 120 μ long and 4-6 μ diam., some mesospores 23-25 x 18-19 μ diam., globose or ovoid.

PUCCINIA CAPSICI Averna-Sacca, on leaves of *Capsicum frutescens*, *C. microcarpum*, *C. odoriferum* and *C. pendulum* in Brazil may be a synonym of *P. capsici* Mayor, q.v.
PUCCINIA CAPSICOLA Kern & Thurston (formerly *Aecidium capsici* Kern & Whetzel) is a rust of stems and petioles of *Capsicum frutescens* in Colombia. Aecia chiefly hypophyllous, caulicolous or petiolicolous, gregarious. Aeciospores angularly oval, 13-18 x 16-24, finely verrucose. Telia in old aecia, blackish. Teliospores 18-23 x 37-55 μ , slightly constricted, wall thickened at apex, pedicel short.

PUCCINIA CESTRI Diet. & P. Henn., in manual under *Cestrum*, is now *Chrysocyclus cestri*, q.v.

PUCCINIA CLAVIFORMIS Lagerh., in manual as *P. huallagensis* and *P. solanita* under *Solanum*, is a brown leaf rust of *Solanum* sp., *S. hirtum*, *S. donnellsmithii*, *S. stramonifolium*, *S. torvum*, *S. aff. myrianthum* and *S. ovalifolium* in Colombia, Panama, Peru, Surinam and Trinidad. Telia hypophyllous, closely grouped in spots 5 cm. diam., small, confluent; teliospores claviform, constricted, 34-40 x 20-26, wall brown, apex sometimes thickened; pedicel persistent, rather short. The description of *P. huallagensis* P. Henn., a synonym, gives teliospores as 30-40 x 15-23 μ , pedicel hyaline to brown, 4-5 μ thick.

PUCCINIA GONZALEZI Mayor, on leaves of *Capsicum* sp. (cfr. *baccati*) in Colombia. Telia hypophyllous, rarely epiphyllous or caulicolous, spots 8-9 mm. diam., brown, small, numerous but not confluent; teliospores ovate or ovate-ellipsoid, 25-31 x 13-24 μ , brownish, not constricted, wall 2-4 μ thick, apex sometimes slightly thickened, up to 5 μ , pedicel deciduous, hyaline, up to 20-40 μ long, 4-6 μ thick, no mesospores.
PUCCINIA HIERONYMI P. Henn., in manual under *Solanum*, is a synonym of *P. nigeriana*, q.v.

PUCCINIA HUALLAGENSIS P. Henn., in manual under *Solanum* is a synonym of *P. claviformis*, q.v.

PUCCINIA IMITANS Syd., is a leaf rust of *Solanum* sp., *S. nigrum* and *S. utile* in Ecuador. Telia diffuse or gregarious, hypophyllous on yellow spots, sometimes over whole leaf, dark brown. Teliospores variable 30-48 x 15-24 μ , constricted at septum, apex up to 11 μ thick, yellowish-brown, pedicel hyaline, persistent, up to 100 μ long.

PUCCINIA LYCII Kalch., on *Lycium austrinum*, *L. dunal*, *L. oxycladum* and *L. tubulosum* in South Africa. Reported from Ohio according to the manual, apparently in error. Uredia mostly hypophyllous, small, brown, scattered; urediospores ellipsoid or ovate, yellowish-brown, 40-54 x 20-33 μ , wall

about 3 μ thick, smooth near base, often mixed with teliospores; telia amphigenous, not forming spots, scattered or grouped, about 1 mm. diam., black; teliospores broadly ellipsoid, flat papilla at apex sometimes, opaque, dark brown, 38-50 x 20-30 μ , wall about 3 μ thick, apex not thickened, pedicel hyaline, thick up to 100 μ long, 10-24 μ of it cylindrical and 60-80 μ at base napiform, 20-45 μ broad tapering to base.

PUCCINIA NEGERIANA Diet., is a brown rust of leaves and petioles of *Solanum incisum*, *S. nodiflorum* and *S. furcatum* in Argentina and Chile. Telia hypophyllous, rarely epiphyllous, small, closely crowded in groups, 1-3 mm. across, bright cinnamon; teliospores usually 1-celled, (mesospores) ovoid or globose, 21-32 x 17-25, rarely up to 37 x 35, two-celled spores elliptical or globose, little or no constriction, 23-40 x 25-31 μ , wall light or dark brown, apex up to 13 μ thick, pedicel firm, hyaline, 2 to 4 times as long as spore. The description of *P. hieronymi*, a synonym, has spots amphigenous; sori scattered but often confluent; spores variable, usually one-celled; apex hardly thickened, 22-33 x 15-30 μ , bright brown, wall 3-5 μ thick, pedicel hyaline or nearly so, up to 60 μ long, 5-7 μ thick.

PUCCINIA NICOTIANAE Arth., was based on a wrongly determined host and is a synonym of *P. acnisti*.

PUCCINIA PAIPIANA Speg., in manual under *Salpichroa* as a leaf and stem rust of *S. rhomboides* in Argentina, Brazil and Uruguay, has been found on *Capsicum* sp. and *Solanum valdivianum* and *S. pinnatifolium*. Telia 0.5-1 mm. broad, variable, brown-purple; teliospores elliptical-ovoid 35-40 x 18-20 μ , apex little thickened, pedicel 40-50 x 5-6 μ , hyaline.

PUCCINIA PASPALICOLA (P. Henn.) Arthur, mentioned under *Aecidium tubulosum* and *P. tubulosum*.

PUCCINIA PAULENSIS Rangel, is a rust of leaves and twigs of *Capsicum frutescens* and *C. microcarpon* in Brazil and Guatemala. Aecidia amphigenous, often densely aggregated, 250-750 x 200-350 μ , golden; aeciospores variable, wall about 1.5 μ thick, 20-35 x 12-24 μ (average 24.8 x 17.8 μ); telia on lower branches, scattered, globose, black, 200-320 μ diam.; teliospores variable, wall 3-4 μ thick, apex 5-8 μ , yellowish-brown, 40-56 x 25-35 μ (average 45 x 29 μ); pedicel persistent, hyaline, 60-100 μ long, 5-7 μ thick.

PUCCINIA PITTIERIANA P. Henn., is a brown leaf rust of *Solanum tuberosum*, *S. demissum* and *Lycopersicon esculentum* in Costa Rica, Colombia, Ecuador, Peru, Mexico, Venezuela and Paraguay. Reported to be destructive at times. Spots brown, scattered; sori hypophyllous, aggregated, rust-colored; teliospores ellipsoid, ovoid, or subcuboid, apex sometimes up to 5 μ thick, 20-30 x 16-22 μ , wall yellow-brown, pedicel up to 60 x 6 μ ; mesospores ovoid, or subclavate, 20-25 x 13-18 μ , intermixed.

PUCCINIA SARACHAE Major, is a rust of *Saracha biflora*, *S. jaltomato*, *S. edulis*, *S. aff. edulis*, *S. antillarum*; in Bolivia, Colombia, Costa Rica, Dominican Republic and Jamaica. Spots rounded, 2-7 mm. across, often numerous and confluent, yellow-brown; telia hypophyllous, minute, confluent, dark brown, center often gray-brown; teliospores ovate or ovate ellipsoid, yellow or yellowish-brown, 23-35 x 16-31 μ , wall about 2 μ thick, apex up to 6 μ thick, pedicel hyaline, persistent, up to 95 μ long and 4-6 μ diam.; mesospores numerous, ovoid or ovate, yellow or yellow-brown, 21-30 x 13-19 μ .

PUCCINIA SOLANACEARUM Sacc. & Syd., in manual as a black rust on leaves of *Solanum* sp. in India, is said by Saccardo to be a synonym of *Puccinia solani* Cke. (not Schw.). See *P. solani* Cke.

PUCCINIA SOLANI Cke. (not Schw.) in manual as *P. solanacearum* Sacc. & Syd., on stems, leaves and petioles of *Solanum* and *Chamaesaracha nana* associated with *Aecidium solani* (q.v.) in India. Apparently the report of this from California, credited to Harkness, is in error (or the California referred to is Lower California, Mexico) as Arthur does not list *P. solani* Cke. (1878), *P. solani* Schw. (1853), or *Aecidium solani* Mont. in his manual for U.S. and Canada. *P. solani* Cke. was described as having small black linear sori under the pubescence; teliospores elliptical, slightly constricted, smooth, brown, 35-60 x 18-20 μ , pedicel long, slender, hyaline.

PUCCINIA SOLANI Schw., is a leaf rust of *Solanum* sp. in Surinam (Dutch Guiana). Telia minute, scattered, compact, occupying whole of under surface and only the midrib of the upper surface, chestnut. Teliospores ellipsoid or ovoid, not constricted, 19-24 x 24-34 μ (Kern), 28-34 x 20-26 μ (Schweinitz), apex 4-6 μ thick, wall pale brown, pedicel long, slender, persistent, upper part pale brownish.

PUCCINIA SOLANINA Speg., is a rust of *Acnistus parviflora* in Argentina and *Acnistus* sp. in Ecuador. Aecia said to be systemic, distorting leaves and tips of branches. Described from material on *A. p.* in Argentina, aeciospores golden, 16-18 μ in diam.; telia often gregarious and confluent at base of petioles, dark rust-colored; teliospores 35-38 x 25-28 μ , pedicel slender, hyaline. Later the aeciospores (same host and country) were given as 18-20 μ and the aeciospores of *Aecidium solaninum* var. *laevis* Speg. q.v. were said to be 13-20 x 14-18 μ (same host and country). *PUCCINIA SOLANITA* (Schw.) Arth., in manual under *Solanum*, is a synonym of *P. claviformis*, q.v.

PUCCINIA SOLANI-TRISTIS P. Henn., produces powdery black sori on leaves of *Solanum neves-armondi*, *S. rufescens*, *S. extensum*, *S. lepidotum*, *S. theobromaefolium* and *S. triste* in Brazil and Ecuador. Spots yellow or orange, scattered;

sori hypophyllous, gregarious, dark; urediospores variable, 10-14 x 9-13 μ , pale yellow or darker; teliospores oblong or subclavate, 20-34 x 11-13 μ , pale brown or darker, constricted at septum, apex hardly thickened, pedicel short, hyaline.

PUCCINIA TIJIBODENSIS Gaum., is a brown leaf rust of *Solanum biflorum* in Java and Guam.

PUCCINIA TRANSFORMANS Diet. (not E. & E.), is a rust of branches, leaves and stems of *Solanum tomatillum* in Chile. Aeciospores yellow, variable, 20-30 x 15-20 μ . Telia closely gregarious on distorted areas, dark brown, about 1 mm. across; teliospores variable, 36-55 (rarely up to 70) x 20-27 μ , wall chestnut, little or no constriction, pedicel long, fragile, hyaline.

PUCCINIA TUBULOSUM (Pat. & Gaill.) Arth., in manual under *Solanum*, is a synonym of *P. paspalicola* (P. Henn.) Arth. (which occurs in southern Florida, southern Texas and Iowa, as well as Mexico, West Indies, Central & South America and southern Asia, according to Arthur.) Pycnia and aecia on *Solanum* spp., uredia and telia on grasses (*Paspalum* and *Syntherisma* in U.S.). Aecia hypophyllous on round brown spots 1.5-2 cm. diam., peridia crowded in circle, erect, tubular, 3-4 mm. long; aeciospores angular or ovoid, pale orange, 26-28 x 20 μ . (From Patouillard's description of *Accidium tubulosum* on *Solanum spinosum* in Venezuela.)

PUCCINIA WEBERBAUERI P. Henn., produces dark-brown pustules on yellow-brown leaf spots on *Solanum* sp. in Peru. Spots yellow-brown, rounded, gregarious; telia hypophyllous, dark chestnut, confluent; teliospores ellipsoid or ovoid, apex up to 8 μ thick, 20-33 x 13-23, wall yellow-brown, pedicel hyaline, persistent, 60-100 x 4-6 μ .

PUCCINIOSIRA HOLWAYI Jackson, is a leaf rust of *Solanum laxiflorum* in Brazil. Pycnia epiphyllous, 90-150 μ high, 120-150 μ broad; telia hypophyllous, in circular groups 1.5-4 mm. diam. Teliospores 16-24 x 36-48 μ , apex often acute, septum often oblique, not constricted, wall sometimes thickened at opposite ends of the two-celled spore instead of at the apex of each cell as in *P. solani* Lagerh. q.v.

PUCCINIOSIRA SOLANI Lagerh., on leaves of *Solanum* sp. in Ecuador. Sori hypophyllous or petiolicolous, densely crowded, large, rounded, orange; teliospores elongate or ovoid, apex often acuminate, not constricted, apex thickened, contents orange, 45-54 x 21-30 μ . Apex of each cell thickened, thickening more pronounced than in *P. holwayi*, q.v.

PYRENOCHAETA FEROX Sacc., forms brownish spots on living stems of *Solanum tuberosum* in England and Italy. Pycnidia densely gregarious, brownish. Conidia 8-9 x 1-1.5 μ , opalescent, cylindrical, obtuse at both ends, spore-mass becoming powdery. (may be in U.S.)

PYTHIUM SPP., a number of species of Pythium are known to affect Solanaceae in the U. S. Some of these are rather widely distributed here but others are primarily foreign organisms, at least in so far as one may judge from the reports, and are believed to warrant inclusion here. The data on the species taken up have been taken from Dr. John T. Middleton's monograph of the genus (1943) or checked with it. Capsicum is listed as a host for 3 species; Lycopersicon, 10; Nicotiana, 10; Solanum, 12. Of the 66 species Middleton considers valid, 18 occur on one or more of these four genera. PYTHIUM APHANIDERMATUM (Edson) Fitz., in manual as P. butleri under Zingiber, has been found to be a root parasite of many diverse plants including Capsicum frutescens, Lycopersicon esculentum, Nicotiana tabacum, Solanum melongena and S. tuberosum, in Asia, Africa, U. S. and various islands. The only reports noted from Europe are on other hosts. Sporangia becoming spherical on release, variable in size, dividing into zoospores averaging about 12 x 7.5 mu; oogonia usually terminal, spherical, 22-27 mu diam.; antheridia usually intercalary and about 9-11 x 10-14 mu, producing a conspicuous penetration tube; oospores single, 17-19 mu diam., wall moderately thick, germinating by production of a germ tube.

PYTHIUM ARTOTROGUS (Mont.) de Bary, originally described from Solanum tuberosum in France, has been reported on various hosts in Europe and Hawaii, and on Pinus spp. and Saccharum officinarum in the U. S. Reports on S. tuberosum now include England, Germany and India as well as France. Also reported on Lycopersicon esculentum in Hungary. Hyphae branched, 2.6-7.8 mu diam. Sporangia lacking; oogonia spherical, 18-27 mu diam., echinulate with conical protuberances 2.7-8.3 mu long and about 1.8 mu wide at base, apex acute; antheridia hypogynous usually; oospores 15-24 mu diam. PYTHIUM BUTLERI Subram., see P. aphanidermatum.

PYTHIUM DELIENSE Meurs, one of the causes of stemburn of tobacco in Sumatra. Sporangia variable in diam. and up to 210 mu long, terminal, usually with inflated lateral branches; zoospores 3-25 or more, 8-12 mu diam. when encysted; oogonia spherical, terminal, usually 16.1-20 mu diam.; antheridia usually 14.1-20.3 mu long and 8.1-11.4 mu wide, making apical contact with the oogonial wall; oospores usually 13.7-16.2 mu diam., wall 1.3-1.8 mu thick.

PYTHIUM MEGALACANTHUM de Bary, originally described as saprophytic on vegetable debris in Germany, has been found on numerous plants in Europe and Japan, including Lycopersicon esculentum in Japan and L. esculentum, and a few unrelated hosts in the U.S. Mycelium fine, branched; sporangia sometimes formed in epidermal cells of host, spherical or sub-spherical frequently proliferous through continued growth of the sporangiophore, forming a secondary sporangium above the primary; zoospores 4-5 mu to 18-20 mu, usually 12-15 mu in size; oogonia spherical, smooth, becoming echinulate, 36-45

mu diam. exclusive of spines; spines 6-9 mu long, conical, usually acutely tipped; antheridia not described; oospores smooth and thick walled, about 27 mu diam.

PYTHIUM PERNICIOSUM Serbinow, causes a blight of tobacco seedlings in Russia. Both *Nicotiana rustica* and *N. tabacum* are infected and inoculations were successful on *Lycopersicon esculentum*, *Solanum dulcamara* and unrelated hosts. Middleton (1943 monograph) reports isolating from rotted poinsettia cuttings in California a fungus which agrees in every detail with Serbinow's description and calls attention to reports of the fungus on *Viola tricolor* in the Netherlands and on *Hibiscus* spp. in Netherlands East Indies. Hyphae 5-9.5 mu diam. may break up into oidia; sporangia filamentous or originating from a swollen sac-like structure on hypha; catenulate spherical reproductive bodies 17.4-30 mu diam. present also, 3-5 in a series; zoospores 8-16 in number, 8-12 mu diam.; oogonia spherical, smooth, thin walled, acrogenous on short mycelial branches, 18.9-30 mu diam.; antheridial cell clavate, apical contact with oogonium; oospores 18.1-23.5 mu diam., germination unknown.

PYTHIUM SPINOSUM Sawada, occurs in Formosa and Japan on a variety of hosts including *Lycopersicon esculentum* and *Solanum melongena* and was found on *Allium cepa* and *Citrullus vulgaris* in the U. S. by Middleton and on *Primula sinensis* in England by Cook and Collins. Hyphae 2.5-5 mu diam.; sporangia more or less spherical, 14-33 mu diam., wall usually smooth; zoospores rarely formed; oogonia 13.2-27.4 mu diam., exclusive of spines which are usually finger shaped, 5-8 mu long and 1.5-2 mu broad at the base; antheridia terminal, 12-32 x 3-5 mu; oospores 10.1-25.3 mu diam., germination not observed.

RAMULARIA OLIDA Wollenw., wound parasite of potatoes in Germany. Conidial and mycelial masses butter yellow, whitish when dry; conidiophores fusoid-branched; chlamydospores 1-2, rarely 3-celled, one-celled spores 6-17 mu long, mostly 7-12 mu.

RHABDOSPORA DESTRUENS Tassi, in manual under *Solanum*, is stated to be a synonym of *Sclerotium rolfsii* Sacc. which is a destructive parasite of numerous diverse hosts in the southern states and occurs in many parts of the world. However, reports may include sclerotial stages of more than one fungus.

RHABDOSPORA LEBRETONIANA Sacc. & Roum., var. *DULCAMARAE* Gz., in dead stems of *Solanum dulcamara* in Spain. Pycnidia scattered or gregarious; spores falcate, 20-25 x 1.5-2 mu; conidiophores short fasciculate.

RHABDOSPORA LEBRETONIANA Sacc. & Roum. f. *SOLANI* Sacc., is reported on stems of *Solanum frutescens* in Portugal. Pycnidia gregarious, dark, 170-210 mu diam., conidia 20-40 x 0.5-1.5 mu, hooked.

RHABDOSPORA SOLANICOLA P. Henn., in rotten stems of *Solanum* sp. in the botanical garden at Para, Brazil. Pycnidia scattered or gregarious, dark, 80-100 μ diam.; spores sigmoid, filiform-fusoid, 15-25 x 1 μ .

RHIZOCTONIA MELONGENA Matz., isolated from decaying seedlings of *Solanum melongena* in Puerto Rico is similar to and may be a strain of *R. solani* which is cosmopolitan.

RHIZOCTONIA PALIDA Matz., is found on roots of *Capsicum* sp., *Saccharum officinarum* and *Zea mays* in Puerto Rico.

RHIZOCTONIA SOLANI Kuehn., see under *Moniliopsis aderholdi* and *R. melongena*.

RHIZOCTONIA SP., in manual under *Vigna*, is said to cause wilting and death of numerous hosts, including *Lycopersicon esculentum*, *Nicotiana tabacum* and *Solanum tuberosum*, in India. Stems at the ground level become blackened and covered with numerous tiny black sclerotia.

ROSELLINIA ARCUATA Petch., in manual under *Thea*, causes a collar rot extending to the larger roots of a number of hosts including *Capsicum frutescens* in India and Ceylon. Underground a white layer of mycelium forms under the bark. Above ground the fungus forms a purple gray layer, which later turns black, around the stem up to a height of six inches or so. Diseased plants may wilt and die, or continue to live producing peculiar enlargements on stems above the girdling. Perithecia gregarious, at first sunken in the brownish-purple mycelium, dark brown becoming black, 1.5-2.4 mm. diam.; asci cylindric, 300 x 8 μ , spores black, boat-shaped, apex acute, often becoming narrowed, 30-47 x 5-7 μ . (from description on *Thea*.)

SACCARDOMYCES SOCIUS P. Henn., parasitic on *Dimerium*, *Asterina*, etc., on leaves of *Solanum* sp. in Peru. Perithecia superficial, gregarious or scattered, 70-100 x 60-80 μ diam., pale brown; asci fasciculate, fusoid or subclavate, 18-30 x 6-8 μ ; spores parallel, acicular-filiform, curved, 17-22 x 2-2 $\frac{1}{2}$ μ , hyaline.

SARCINELLA RAIMUNDI Sacc. (also spelled *S. raimundoi*), attacks under side of dying leaves of *Solanum melongena* in the Philippine Islands, also affects petioles. Growth blackish, 1-2 mm. long; conidia of two forms, some sarciniform, 6-8-celled, 33-35 μ diam., smoky; others broadly fusoid, slightly curved, apex acute, 25-28 x 10 μ , 3-septate, not constricted, two inner cells olivaceous-smoky, outer ones subhyaline.

SARCINELLA (?) *SOLANICOLA* Speg., on living leaves of *Solanaceae* in Brazil. Mycelium dark brown; conidia acrogenous, solitary, subglobose, 16-20 μ diam., 4-6-celled, in one row, 10-12 μ diam., opaque smoky. Said to be conidial stage of *Dimerosporium solanicolum*, q.v.

SCHINZIA SOLANI Fautr., see Entorrhiza solani.

SCLEROPHOMA CAPSICI Lobik, forms variable gray spots with dark brown imbedded pycnidia on fruits of chilli pepper in the Terek district of Russia. Pycnidia develop freely on seed of infected fruits. Sclerotia numerous, 129-230 x 129-157 μ . Conidia imbedded in a jelly-like mass, extremely variable, 8.2-16.6 x 2.6-3 μ .

SCLEROPHOMA DULCAMARAE Hoehn., reported on dry stems of Solanum dulcamara in Germany, without a description.

SCLEROTINIA FUEKELIANA de By., which attacks many hosts in Europe is reported on potatoes in Hungary. Saccardo gives the conidia as Botrytis cinerea Pers. some forms of which are common parasites of numerous hosts in U. S. Apothecium 0.5-3 mm. broad, 5-10 mm. high, yellow-brown; asci terete-clavate, 130 x 12-13 μ ; spores ovoid, hyaline, 10-11 x 6-7 μ .

SCLEROTINIA NICOTIANAE Oud. & Konig., causes rotten areas covered with gray mold on leaves and stems of Nicotiana tabacum in Holland, Bavaria, Hungary, Sweden and West Prussia. Black sclerotia form in decaying areas. Possibly a synonym of S. sclerotiorum (Lib.) Mass. which is cosmopolitan. Sclerotia superficial on stems and leaves, black outside, white inside, up to 10 mm. long and 5-6 mm. broad; ascomata up to 20 from each sclerotium, with stalk 4-6 cm. long 0.5 mm. diam., expanded apothecial cups 0.8 mm. diam., 0.2 mm. high; asci cylindric, 160-180 x 6-7 μ , spores elliptic, 5-7 x 3-4 μ , in upper two thirds of ascus.

SCLEROTINIA SCLEROTIUM (Lib.) Mass., see under S. nicotianae.

SCLEROTIUM ROLFII Sacc., see under Hypochmus centrifugus, S. zeylanicum and Rhabdospora destruens.

SCLEROTIUM SEMEN Tode, see Typhula variabilis.

SCLEROTIUM SETOSUM Bewley & Shearn, in manual under Lycopersicon and said to be a stage of Colletotrichum tabificum (Hallier) Pethybr. and Vermicularia varians Duc. is said by Dickson to be identical with Colletotrichum atromentarium (B. & Br.) Taub. and hence in this country. See note under V. varians. The fungus is destructive at times.

SCLEROTIUM SOLANI P. Brun., on dry stems of Solanum tuberosum in France. Subglobose or oblong, scattering, confluent, brown or brownish black, 0.5-1 mm. diam., black within.

SCLEROTIUM TECTUM Fries F. MINUS Rab., on Solanum tuberosum in Europe. Sclerotia small, rounded, irregular, often in rows, unevenly wrinkled, black, white within.

SCLEROTIUM ZEYLANICUM (B. Br.) Petch, in manual as causing a root and collar rot of Aristolochia leucocentra and seedling disease of cultivated Thea and other economic plants in Ceylon attacks Capsicum frutescens (chilli). Sclerotia are about 1 mm. in diam., produced on fleecy white patches of mycelium, white becoming brown. Perhaps a strain of

Sclerotium rolfsii Sacc., at least likely to be confused with it.

SEPTOBASIDIUM BOGORIENSE Pat., is said to occur in association with scale insects on *Solanum quitoense* in Netherlands East Indies. The fungus occurs on many other hosts also, in Asia, South America, Netherlands East Indies. Boedijn & Steinmann describe the fungus in the Netherlands East Indies as growing on trunks, branches and petioles, rarely on leaves, forming plates of variable size up to 15 cm. or more long, sometimes enveloping branches. Spots on leaves usually not more than 1-2 cm. across. Color gray washed with violet, sometimes gray-brown. Plates stratified, in section. The filaments which give rise to the probasidia develop laterally, are sessile or with short pedicels, spherical, 6-9 μ diam. Basidia are 25-34 x 4-5 μ ; basidiospores cylindrical, 11-15 x 2-3 μ .

SEPTOBASIDIUM JAMAICAENSIS Burt., occurs on *Solanum punctulatum* in Jamaica. It and the associated insects do considerable damage to the host plants. Body of fungus variable, up to 1 cm. thick, drying down to 2-4 mm. thick; rhizomorphs blackish-brown tinted purple, fruiting area gray over brown; hypochnoid areas show clusters of the spore-bearing organs 70-100 μ thick, probasidia borne laterally; basidia of all ages and sizes may be present; mature basidia 8-14 x 40-62 μ , two celled, sterigma long; spores white, 6.8-11 x 23-39 μ including bent end, mostly 8 x 27 μ , usually 3- and up to 7-septate, often budding later.

SEPTOCYLINDRIUM FASCICULATUM Speg., occurs on living leaves of *Solanum pseudocapsicum* in Argentina. Spots none or pale yellow, cushions hypophyllous, velvety, covering the spot, 2-6 mm. diam.; conidia at first filiform-catenate, 80-110 x 2 μ , continuous, fasciculate, later septate, especially near the apex, constricted, also separating; 1-4 pseudo-septa dividing protoplasm into sections 15-50 x 2 μ , olivaceous.

SEPTORIA DIVERSA Sacc. & Syd., on drooping leaves of *Nicotiana longiflora* in Argentina. Spots amphigenous, sometimes confluent, 1-20 mm. diam., sometimes dark reddish, center becoming dried out, gray, sometimes definitely whitish with or without a narrow reddish halo; pycnidia epiphyllous, loosely gregarious near center of spot, 80-100 μ diam., dark; spores not or hardly subclavate, 25-40 x 1.5-2 μ . (mentioned under *S. nicotianae* Pat.)

SEPTORIA DULCETARAE Desm., causes subcircular leaf spots 3-4 mm. diam. on *Solanum dulcamara* in Europe. Spots brown turning gray; epiphyllous pycnidia 90-120 μ diam., black; cirrhi light flesh color; spores 3-4-septate, 50-60 x 1.7 μ (x 1.5-2.5 μ according to Grove.)

SEPTORIA MELONGENAE Lobik, causes gray to brown rounded spots 0.2 cm. across with thickened margins on leaves of *Solanum*

melongena in Terek district Russia. Pycnidia brown, 121-198 μ diam. Conidia 7-8-septate, 39.5-72.4 x 1.6-2.5 μ .

SEPTORIA NICOTIANAE Pat. (not Speg., which is a synonym of *S. diversa*), causes brown to white zoned leaf spots on *Nicotiana affinis*, *N. rustica* and *N. tabacum* in Russia, Ecuador and Jamaica according to the manual but Wolf lists France only although Patouillard described it from Ecuador. (This is not the frog-eye organism as indicated in the manual, the frog-eye disease is caused by *Cercospora nicotianae* E. & E. which occurs in the U. S.) Pycnidia often hypophyllous, 90-140 μ diam.; spores 50-55 x 2-3 μ ; 3-4-septate.

SEPTORIA PALAN-PALAN Speg., in living leaves of *Nicotiana glauca* in Argentina. Spots circular, dried out, almost transparent, margin roughened and thickened, 3-10 mm. diam.; pycnidia often epiphyllous, dark, 90-120 μ diam.; spores curved, 1-3-septate or continuous and multiguttulate, 75-80 x 2.5-3 μ .

SEPTORIA PSEUDO-QUINAE Pat., in leaves of *Solanum pseudoquina* in Ecuador. Spots amphigenous, rounded, scattered, 1-2 mm. diam., dark then whitish, margin narrow, black; pycnidia epiphyllous, black, 120 μ diam.; spores cylindric, pluriseptate, 50 x 1.5 μ .

SEPTORIA SOLANICOLA Grove (not E. & E.) is described as occurring on stems of *Solanum dulcamara* in England. Pycnidia more or less gregarious, not crowded, blackish, about 300 μ diam. Spores mostly straight, faintly one septate, 15-25 x 1.7-2 μ .

SEPTORIA SOLANIMA Speg., on wilting leaves of *Solanum gracile* in Argentina and reported on *S. nigrum* in California. Spots rounded, 1-2 mm. diam., amphigenous, dried out, white surrounded by a more or less broad band of dark purple; pycnidia epiphyllous at center of spot, often solitary, 80-100 μ diam.; spores acute at both ends, 40-60 x 2 μ , continuous.

SEPTORIA SOLANI-NIGRI Scalia, on living or wilting leaves of *Solanum nigrum* in Italy. Spots circular, scattered or confluent, amphigenous, white to dark, slightly raised on upper surface, darker margin, on lower surface surrounded by an olive-yellow line; pycnidia epiphyllous, not distinct, 70-90 μ diam.; spores filiform, 20-30 x 0.5-1 μ , septa indistinct.

SEPTORIA SOLANOPHILA Speg., common on living leaves of *Solanum verbascifolium* in Argentina. Spots amphigenous, 1-3 mm. diam., whitish bordered purple; pycnidia epiphyllous, near center of spots, solitary or few, 80-100 μ diam., dark; spores acicular, slightly curved, 50-80 x 3-4 μ , 3-5-septate.

SEPTORIA TABACINA McAlp., causes a leaf spot on *Nicotiana tabacum* in Australia.

SEPTORIA TOMATES Speg., causes a spotting of leaves of *Lycopersicon esculentum* in Brazil and Rumania. Spots 1-3 mm. diam., often confluent over the whole leaf, concave and dark brown on upper surface; pycnidia solitary or few in loose groups, hypophyllous, 60-90 μ diam.; spores curved or subsigmoid, 30-50 x 1 μ , septa indistinct or lacking, (Spegazzini). Savulescu's measurements in Rumania were pycnidia 56-148 μ , spores 36.3-59.4 μ .

SEYNESIA BALANSAE Speg., is a fly-speck fungus occurring on numerous host families in Brazil, f. SOLANI-VERBASCIFOLII Rehm. occurring on *Solanum verbascifolium*. Perithecia epiphyllous, 100-120 μ diam.; asci globose-ovoid, 30 x 20-25 μ . Ascospores one-septate, sharply constricted, 18 x 10 μ , elliptic-ovoid.

SIROTHECIUM GLOBOSUM Petch, occurs on dead stems of *Nicotiana tabacum* in Ceylon. Pycnidia superficial, black, globose, 0.3 mm. diam., glabrous, without ostiole; wall black, opaque; spores light brown, ovoid, 4-6 x 3-3.5 μ .

SPERMOPHTHORA GOSSYPII Ashby & Nowell, is a stigmatomycosis fungus infecting lint and seeds of *Gossypium* spp. and fruits of *Lycopersicon esculentum* in the West Indies, also reported on *Vigna catjang*, *V. unguiculata* and *Phaseolus lunatus* from British Guiana and Belgian Congo. Sporangia fusiform and linear or comma or spirillum-shaped, 75-110 x 10-17 μ when sub-terminal, 20.5 μ when apical. Primary spores indefinite in number, convex-linear, apex pointed, base rounded. A rib-like spicule extends from the middle of the spore beyond the apex. Spores 18-21 x 2-2.5 μ . Secondary sporangia cylindric-oval, usually 5-7.5 x 3.5-4 μ , secondary spores usually 8 or 12, 4.5-6 x 1.5 μ , cylindric, curved.

SPHAERELLA DUBIA L. E. Miles, on living leaves of *Solanum* sp. (?) in Puerto Rico. Spots amphigenous, numerous, rounded or somewhat irregular, up to 2-3 cm. diam., often confluent, dry, pale brown, margin dark brown, indefinite; perithecia epiphyllous, scattered, 45-60 μ -diam., asci ovoid, curved, 24-27 x 10 μ ; spores fusoid, not constricted at septum, 10 x 3-3.5 μ .

SPHAERELLA NICOTIANAE Ell. & Ev., mentioned under *S. tabaci*.

SPHAERELLA TABACI Maubl., is reported on stems of *Nicotiana tabacum* in France and Abkhazia, part of Russia. Similar to *S. nicotianae* E. & E. which occurs in the U. S. Perithecia 125-150 x 100-120 μ ; asci cylindric, 50-67 x 10-13.5 μ . Ascospores one-septate, 14-16.5 x 6.5-7.5 μ .

SPHAERULINA HAINAENSIS Frag. & Cif. and its (supposedly) conidial stage, *Phyllosticta hainaensis* Frag. & Cif., occur on leaf spots on *Nicotiana tabacum* in Dominican Republic. Not considered important there.

SPICARIA SOLANI Hart, is listed as occurring on old potatoes in Germany.

SPONDYLOCLADIUM ATROVIRENS Harz., see under Phellomyces sclerotiphorus.

SPONGOSPORA SUBTERRANEA (Walls.) Lang, in manual under Solanum, as a disease of potato, tomato and Solanum spp., is now known to be widely distributed in the U. S. and elsewhere. Intercepted from Algeria, Argentina, Australia, Belgium, Brazil, British Columbia, Chile, China, Costa Rica, Denmark, Ecuador, Egypt, England, Esthonia, Finland, France, Germany, Ireland, Italy, Japan, Malta, Mexico, Netherlands, New Brunswick, Newfoundland, New Zealand, Norway, Nova Scotia, Peru, Poland, Portugal, Scotland, Spain, Sweden, Tasmania, Union of South Africa and Wales.

SPORODESMIUM EXCITOSUM (Kuehn) var. SOLANI Fekl., (or Schenck) occurs on stems of Solanum tuberosum in Russia.

SPORODESMIUM MELONGENAE Thuem., on living leaves of Solanum melongena, in Brazil, Bulgaria, Italy and Portugal. Growth amphigenous, or sometimes epiphyllous, solitary, black, in spots that are dried out angular or oblong, with concentric zones of brown and yellow brown; conidia long clavate, mostly 7-septate, cells sometimes with a longitudinal division, pale olive brown, 60-75 x 14-18 mu, pedicel gray, 18-24 x 8-10 mu.

SPORODESMIUM SOLANI-VARIANS Vanha, on still living leaves of Solanum tuberosum often killing them, in Europe. Species extremely variable, said by some to have Cladosporium and Phoma stages; conidia extremely variable but typically obclavate, acrogenous, occasionally in short chains, 4-8-septate, sometimes with a longitudinal septum, sooty, variable in size but usually within the ranges 20-50 x 8-16 mu.

STAGONOSPORA DULCAMARAE Passer., on dead stems of Solanum dulcamara in northern Italy. Pycnidia scattering, solitary or few in a group, growing together, black; spores fusiform, curved, 5-septate, 30 x 4 mu. Probably a stage of a Gibberella.

STEMPHYLIUM TABACI Oud., is said to cause a leaf spot of tobacco in Holland. Fertile hyphae gray-brown, more or less jointed; conidia acrogenous, polymorphous, usually 3 transverse and 1-3 vertical septa, dimensions variable, 32 x 20 or 24 x 14 or 20 x 20 mu.

STOMATOCHROON SP., an alga, is reported as occurring on tomato leaves in Guatemala. Species of this genus live in the stomata of their hosts often producing a coppery sheen on the leaf surface. Their taxonomy has not been adequately studied.

STOMIOPELTIS DEVIATA Syd., occurs on the hard outer coat of fruits of *Solanum grandiflorum* in the Philippines. Spots small, indistinct, smoky-brown or gray-brown, sometimes confluent. Perithecia loosely or closely scattered, 130-170 μ diam.; asci clavate or variable 24-35 μ long and lower part 10-14 μ broad. Spores 2-celled, 10-12 μ long, upper cell 3.5-4.5 μ broad, lower cell narrower.

STRIGA OROBANCHOIDES Benth., a flowering plant, is a root parasite of *Nicotiana rustica* in Southern Rhodesia and *N. tabacum* in South Africa.

SYNCHYTRIUM ENDOBIOTICUM (Schilb.) Perc., potato wart, in manual as *Chrysophlyctis endobiotica* under *Solanum*, has been intercepted in potatoes from Bolivia and Peru, and has been reported from Algeria, Austria, Belgium, Canada, Czechoslovakia, Danzig Free State, Denmark, England, Faroe Islands, Finland, France, Germany, Ireland, Japan, Malta, Miquelon Island, Newfoundland, Poland, Portugal, Rumania, Scotland, Spain, St. Pierre, Sweden, Switzerland, Union of South Africa, Wales, Pennsylvania, West Virginia and Maryland. A 1940 paper (112 pp.) by Russian workers states that wart has not been found in the U.S.S.R. but is known to occur in the newly acquired territories Carelia (formerly part of Finland) and White Russia and Ukraine (formerly parts of Poland). The report from Spain may be an error. Apparently eradicated from Canada. (A new infection was found in Nova Scotia in 1941 and cleaned up.)

TILACHLIDIUM NIGRESCENS El. & Em. Marchal, in fruit of *Pyrus* and tubers of *Solanum tuberosum* in Belgium. Symmetata arborescent, ultimate branches acicular, ends somewhat inflated, 16-24 x 1-1.8 μ ; heads globose, 20-60 μ diam.; spores ovate or rarely subglobose, 3.5-4.2 μ diam., smooth, dark.

TORULOIDEA NICOTIANAE (Pezz. & Sacc.) Sumstine, see *Oospora nicotianae*.

TRICHAEGUM DULCAMARAE Passer., on dead branches of *Solanum dulcamara* in northern Italy. Acervuli more or less globose; hyphae erect, flexuous, dark, tip pellucid, septate, about 75 x 2.5-3 μ ; conidia obovate, base attenuate, 3 to many septate, muriform, sooty, pellucid, usually 20-50 x 12-20 μ on stalks 25-30 μ long. Probably secondary.

TRICHODERMA VIOLACEUM Oud., on rotting leaves of *Nicotiana tabacum* in Holland. Fertile hyphae continuous, 35 x 1.5-2 μ , branches ending in violet-black globules of conidia 10-14 μ diam.; conidia globular, bright violet, 2-3 μ diam.

TRINACRIUM VARIABLE Roum., occurs on dry stems of *Lycopersicon esculentum* in France. Conidia hyaline with three unequal branches, one at the apex rotund, others pointed and 1-septate; maximum height of first branch 12 μ , second 10 μ and third 6 μ , all 3-4 μ thick.

TUBERCULARIA ARGENTINA Speg., on leaves and decaying stems of *Solanum glaucum* in Argentina has bright red sporodochia 200-300 μ diam., sporophores 10-15 x 1 μ . Conidia acrogenous, single 2-3 x 1 μ , often curved, hyaline. *TYLENCHUS DIPSACI* Kuehn., in manual as attacking potatoes is now called *Ditylenchus dipsaci*, q.v.

TYPHULA PHAEOSPERMA P. Henn., on rotting leaves of *Solanum* sp. Pilei hypophyllous, scattered, filiform, fusoid or clavate, pale, later brown, 2-4 mm. long, 180-200 μ thick; basidia clavate with 2-4 sterigmata, 18-24 x 46; spores globose, brown, 4-4.5 μ diam.

TYPHULA STRICTA Appel, on dry stems of *Solanum tuberosum* in Germany. Pilei globose, up to 5 mm. across, shining black; stalk 13-32 mm. high, 1.5 mm. through; basidia 5-7 μ through, with 4 sterigmata; spores ellipsoid, 6-8 x 3-4.5 μ .

TYPHULA VARIABILIS Riess, is destructive on potatoes and sugar beets in Europe and Azores. A saprophytic or weakly parasitic form is found in the U. S. and Canada on stored vegetables, overwintered straw and plant debris. The sclerotial stage (*Sclerotium semen* Tode) has been intercepted on *Colchicum* sp. and *Iris* spp. from France and Netherlands. Color variable. Spores 10-13 x 4-6 (Britz.), 6-7 x 2.5-3 (Schroeter).

UREDO DOMINGENSIS Berk., on leaves of a plant believed to belong in the Solanaceae, in San Domingo. Hypophyllous, no spotting; sori scattered, orbicular, epidermis persistent around edges; urediospores obovate, pale.

UREDO INVISA Speg., on leaves of *Solanum sisymbriifolium* in Argentina and Uruguay. Spots amphigenous, orbicular, distinct, dry, brown, 1-3 mm. diam., almost always separate; sori hypophyllous at center of spots, solitary or rarely 2 or 3 together, 0.5-1 mm. diam.; urediospores ovate or globose, 26-30 x 20-25 μ , at first with a pedicel 40-50 x 5 μ . (See *Uromyces invisa*)

UREDO MIMITANS Speg., is a brown rust of *Solanum commersoni* in Argentina. Spots 1-5 mm. diam., orbicular or often limited by veins, pale reddish or brown, distinct, often with concentric ridges and yellowish bands; sori hypophyllous, near center of spot or often otherwise, yellowish to reddish; urediospores globose or ovate, 20-30 x 20-24 μ , wall densely and minutely echinulate, contents golden, borne on hyaline pedicels 40-60 x 5-6 μ .

UREDO NICOTIANAE Anast., Sacc. & Splend., produces a powdery brown rust on leaves of *Nicotiana quadrivalvis*, *N. sylvestris* and *N. tabacum* in Italy and, according to Arthur, on *N. bigelovi* in southern California. Also reported from Brazil and Nevada. Urediospores 23-26 x 24-32, closely and coarsely verrucose (Arthur). The description as given

in Saccardo, differs somewhat from Arthur's. Uredia amphigenous, yellow, 1-2 mm. diam., gregarious; urediospores, globose, ellipsoid or rarely oblong, 24-32 μ diam.; wall thick, hyaline, verrucose; stalk nearly lacking.

UREDIO SOLANINUM P. Henn., occurs on leaves of Solanum sp. in Usambara, Belgian Congo. Spots pale or brownish, rounded, scattered; sori hypophyllous, golden-rusty, confluent; urediospores subglobose or ovoid, sometimes angular, yellowish, 23-26 x 22-25 μ , wall subhyaline densely sharp-verrucose.

UREDIO TOLIMENSIS Kern & Whetzel, occurs on leaves of Solanum sp. in Colombia. Uredia cinnamon-brown, hypophyllous, in groups, 0.2-0.8 mm. across on roundish spots 0.3-0.8 mm. across, ruptured epidermis conspicuous; urediospores broadly ellipsoid, 23-32 x 32-39 μ , wall brownish yellow, 3-3.5 μ thick, often with slight hyaline umbo at apex, prominently and obliquely striate.

UROCYSTIS HIERONYMI Schroet., in manual under Solanum, is a synonym of Polysaccopsis hieronymi, q.v.

UROMYCES CESTRI Mont., produces yellow and powdery black rust on leaves of Cestrum atroxanthum, C. aurantiacum, C. auriculatum, C. lanatum, C. laurifolium, C. macrophyllum, C. pallidum, C. parqui, C. pseudoquina, C. schlechtendali, C. strigillatum, C. parviflorum, C. undulatum, in Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Jamaica, Mexico, Peru, Puerto Rico, Uruguay, Virgin Islands, and on C. diurnum in Cuba and one collection in Florida. Epiphyllous; no spots; sori orbicular, concentric, dark brown; teliospores dark brown, ovoid, pedicel hyaline, broad, persistent, wall thick.--mentioned under Aecidium vestiae.

UROMYCES CESTRICOLA Speg., on leaves of Cestrum pubescens in Argentina. Aecia and telia occurring together; aecia on little branches which are slightly or not at all deformed; peridia tubular 1-2 x 0.25 mm., loosely gregarious; aeciospores subglobose, 25-32 μ diam., golden, thick walled; telia amphigenous scattered or loosely gregarious, often confluent, dark; teliospores globose to ovate, 25-30 x 20-25 μ , pedicel 50 x 5 μ .

UROMYCES INVISA Speg., has been reported as the perfect stage of Uredo invisae, q.v. but data not found.

UROMYCES MACULANS (Pat.) Arth., is a brown leaf rust of Cestrum calycinum, C. nocturnum in Bolivia, Costa Rica, Guatemala and Salvador. Aeciospores largely globoid, 18-26 x 24-29 μ ; teliospores rounded or obtuse, wall 1.5-2.5 μ thick.

UROMYCES SALPICHROAE Jackson & Holway, occurs on Salpichroa diffusa in Ecuador and Salpichroa sp. in Bolivia. Uredia few, golden-brown, 0.3-0.5 mm. diam. Urediospores ellipsoid, 17-21 x 23-28 μ , wall 1-1.5 μ .

thick. Telia similar to uredia, compact, pale chestnut-brown. Teliospores obovate, 13-19 x 25-38 mu, wall 1 mu or less thick, apex 4-7.5 mu thick, pedicel hyaline, as long as the spore or shorter.

UROMYCES SOLANI Diet. & Holw., produces golden-brown uredia and chestnut-brown telia on small yellow spots on lower surface of leaves of Solanum sp., S. appendiculatum and S. nudum, in Colombia, Guatemala and Mexico. Uredia scattered; urediospores obovate, echinulate, 23-33 x 18-21, pale brown. Telia few, scattered, compact. Teliospores 30-48 x 10-17 mu (or 10-16 x 29-42 in No. Am. Fl.) wall 1 mu thick, apex thickened to 6-10 mu, pedicel tinted, about same length as spore.

VALSARIA NATALENSIS Doidge, on dead branches of Solanum auriculatum in Natal, South Africa. Stromata occurring unevenly over whole surface of stem, single stroma irregularly circular, up to 1 mm. diam., becoming dark brown. Perithecia one or 2-4 or more in a stroma, 200-450 mu diam.; asci numerous, clavate, 100-150 mu long, spore bearing part 50-72.5 x 11-12.5 mu; spores brown, fusoid or ellipsoid, 1-septate, constricted, 12.5-16 x 5.5-6.5 mu; paraphyses numerous, about 1 mu thick. Presumably secondary.

VERMICULARIA CAPSICI Syd., in manual under Capsicum, is reported as a serious disease of Capsicum frutescens in India, Ceylon, China, Philippines, and Georgia. Intercepted on Capsicum frutescens from Cuba, Haiti, Jamaica, Java and Mexico and what appeared to be this on Physalis sp. from Mexico, also reported from Puerto Rico on C. frutescens. Other hosts reported are Lycopersicon esculentum, Solanum melongena, and Dolichos biflorus, D. lablab and Vigna catjang. In Georgia the fungus causes a serious "ripe rot" of pimento. Elsewhere it sometimes kills plants. Setae up to 150 mu long. Spore masses pink, spores hyaline, curved, narrowed at the ends. 17-23 x 3-4 mu.

VERMICULARIA VARIANS Ducomet, causes a 'black dot' disease of Solanum tuberosum in Europe. Reported from Australia, Brazil, Canada, Greece and South Africa. Intercepted from Argentina, Germany, Ireland, Italy and Netherlands. Lycopersicon esculentum and Physalis peruviana are said to be hosts. Dickson (Mycologia 17:217) considers this synonymous with Colletotrichum atramentarium (B. & Br.) Taub., as is C. tabificum, and hence in the U. S. See also Sclerotium setosum, under Lycopersicon in manual, and in these notes. Pycnidia 75-150 mu across, setae black, 100-130 x 3.5-4 mu, bisepate; spores curved, acuminate, 18-22 x 2.5-3 mu; sporophores uncolored or base brown, 20-30 x 3-3.5 mu.

VERTICILLIUM ALBO-ATRUM Reinke & Berth., see under V. dahliae.

VERTICILLIUM CANDIDULUM Sacc. var. SOLANI (Riv.) Sacc., in

rotten potatoes in Italy, France and Netherlands. Conidiophores 100-150 x 3.5-4.5 μ ; conidia 6-6.5 x 3.5 μ , hyaline. *VERTICILLUM DAHLIAE* Kleb., in manual under Dahlia, is now known to be well established in the U. S., hosts including *Lycopersicon esculentum*, *Solanum melongena* and *S. tuberosum*. It has been reported on *Capsicum* sp. Conidiophores erect, cylindrical, 120-170 x 4 μ ; verticilia 1-3 with 3-4 branches on each, branches acicular, 16-27 x 1.5-2 μ ; conidia acrogenous, ellipsoid-oblong or subcylindrical, 4-7 x 1.5-2, sometimes forming small heads. See *V. tracheiphilum*. Careful work by Wollenweber in Germany, Cheney in Australia, and Rudolf in California indicates that *V. dahliae* is a synonym of *V. albo-atrum*.

VERTICILLIUM NIGRESCENS Pethybr., is found on scabby potatoes in Ireland. Conidia oblong, about 7 x 2 μ . Chlamydospores globose and about 4.3 μ in diam. or sub-oval and about 6 x 4 μ , dark.

VERTICILLIUM NUBILUM Pethybr., is reported from Ireland on rotting tubers of *Solanum tuberosum*. Conidia oblong, about 9 x 3 μ , chlamydospores chainlike or in masses, subglobose, 8.5-12 μ in diam., dark.

VERTICILLIUM PULVERULENTUM Gouventak, is reported to cause circular, sharply delimited, dark spots on fruits of *Lycopersicon esculentum* causing premature fall, in Netherlands. Conidiophores 77-108 μ long, 3-3.5 μ diam. at base. Conidia 2.75-6 x 2-4 μ , average of 200 spores approximately 4.1 x 3.2 μ , remaining in heads about 12 μ diam.

VERTICILLIUM TRACHEIPHILUM Curzi, causes a destructive wilt of *Capsicum frutescens* (chillies) and *Solanum melongena* in Italy. (It has been suggested that this may be a synonym of *V. dahliae*).

VESTERGRANIA, mentioned under *Guignardiella nervisequia*.

VOLUTELLA NICOTIANAE Oud., on rotting leaves of *Nicotiana tabacum* in Holland. Sporodochia scattered, white 300-350 μ diam., sessile, globose or depressed globose; setae 450 μ long; conidiophores 80 μ long, fasciculate; conidia oblong, acrogenous, 6-8 x 2.5-3 μ .

WINTERINA ACANTHOSTIGMOIDES Rehm., on leaves of *Solanum* sp. in Brazil. Perithecia scattered, globose, 120 μ diam.; asci fusiform-clavate, 60 x 10 μ ; spores subclavate, 3-septate, 15 x 3.5-4 μ .

XANTHOCYROA SOLANI Roze, a myxomycete, occurs in cells of potato tubers in Franco. Plasmodii 30 to 120 μ diam., destroying starch, at first sulphur colored, later reddish brown.

VIRUS DISEASES are destructive and many of those in foreign countries are not known to occur here, but we have no practicable means for detecting their presence in most plant materials as offered for entry and we cannot accurately evaluate the fragmentary or confusing data available regarding many foreign virus diseases reported. The following notes are based on Francis O. Holmes' "Handbook of Phytopathogenic Viruses", Kenneth M. Smith's "A Textbook of Plant Virus Diseases" and notes made from other sources. Information is given under names conforming to the Holmes system where these are known to us, otherwise under the Smith system of numbered names, if known. Where the Holmes and the Smith system designations are unknown notes are given under any convenient name. There are so many confusing synonyms among the virus names that it seemed essential to provide an alphabetical list of those used in the notes. Symptoms of individual virus diseases are variable, would require considerable space to describe, and in most cases would be useless to an inspector and hence are omitted. Little is known regarding the mode of transmission or spread of many virus diseases in nature and transmission data based on artificial inoculations by mechanical means are usually omitted in these notes. Susceptible plants as given in Holmes have been listed as hosts in some cases although it seems probable that some of them were determined by inoculation tests rather than being found diseased in nature. Incidentally, it must be borne in mind that viruses are not subject to anatomical descriptions, host reactions vary greatly, symptoms are difficult to so describe that misunderstanding is impossible, hence confusion seems inevitable, especially in the case of viruses reported from widely separated countries or grouped as one but occurring in distinct strains or capable of breaking up or separating into distinct strains when studied on a variety of hosts under controlled conditions. A distinct foreign strain of a virus "species" or "variety" which occurs here may be potentially destructive if introduced and hence as important from the quarantine standpoint as though it were listed as a distinct "species."

AGERATUM VIRUS DISEASE, causes discoloration and distortion of leaves of *Ageratum conyzoides*, a common local weed, and of *Nicotiana tabacum* in Ceylon. May be mixed strains of *Ruga tabaci*. Transmissible by white flies (and by grafting.)
ANANIAS VIRUS 1, see Tomato ring spot, and *Lethum australiense* var. *typicum*.

ANNULUS BERGERAC Holmes, causes necrosis and systemic mottling of *Nicotiana tabacum*, *N. glutinosa*, *Datura stramonium*, *Lycopersicon esculentum* and *Phaseolus vulgaris* in France. Plants may recover and be immune to reinfection. Synonyms:

Nicotiana virus 14; Bergerac-ring-spot virus.

AUCUBA MOSAIC, STRAIN A, affects Lycopersicon esculentum and Nicotiana sylvestris (latter by inoculation only perhaps) near Moscow, Russia.

AUCUBA-MOSAIC VIRUS, see Marmor tabaci var. aucuba.

BERGERAC-RINGSPOT VIRUS, see Annulus bergerac.

"BLACK PEST" OF TOMATO, see Lethum australiense var. typicum.

"BLACK STRIPE" OF TOMATO, see "streak" or "black stripe" disease.

"BLANCHING" OF CHILI or "BLANQUETA" DEL PIMIENTO (Capsicum frutescens) in Valencia, Spain is transmissible by Myzus persicae and perhaps by seed. Causes mottling and crinkling of the leaves, and the skin of the affected fruit has a granular texture with striation or slight creasing. Causes considerable damage.

"BLANQUETA" DEL PIMIENTO, see "Blanching" of chilli.

BUSHY-STUNT VIRUS, see Marmor dodecahedron.

CANADA STREAK VIRUS, see Marmor aucuba var. canadense.

CHLOROGENUS EUTETTICOLA Holmes (in U.S.), see leaf curl of beets and tomatoes in Argentina.

"CORCOVA" of TOBACCO, see Lethum australiense var. typicum.

DATURA VIRUS 1 Smith & Oliveira, affecting Datura stramonium, Nicotiana tabacum, N. glutinosa, Lycopersicon esculentum, and Vigna sinensis, in England, may have Myzus persicae as a vector. DATURA VIRUS 2, or little leaf of brinjal (eggplant), affects both purple and white flowering varieties of Datura fastuosa as well as Solanum melongena, in India. Insect transmission was effected by means of Eutettix phacitis and Empoasca devastans from eggplant to eggplant and to Solanum xanthocarpum, S. trilobatum and Datura fastuosa; transmission by grafting was affected to Withania somnifera, potato, Solanum pubescens and S. seaforthianum.

DI VERNON STREAK, see Solanum virus 5.

ENATION MOSAIC STRAIN, see Marmor tabaci var. deformans.

GALLA AUSTRALIENSIS Holmes, synonyms: - Lycopersicon virus 5; tomato virus 3; tomato big-bud virus; tomato rosette virus; tomato blue-top virus; tomato bunchy-top virus; sheath-calyx virus; tomato fruit-woodiness virus; stowboor virus; "stolbur." Hosts are Lycopersicon esculentum, Solanum nigrum, in Australia and Crimea. Leaves, flowers and fruits abnormal. Dana reports big-bud on tomatoes in the Pacific Northwest since 1937. Apparently the same virus infects common beans, lima beans, soy beans and others.

"GELBFLECKIGHEIT" or yellow spotting of tubers of *Solanum tuberosum* in Germany, internal yellow patches 2 to 10 cm. in diam., usually without external symptoms. Cause unknown.
GILAH VIRUS, see *Ruga tabaci*.

GLASSHOUSE STREAK VIRUS, see *Marmor tabaci* var. *canadense*.
HUNCHBACK or "Corcova" of tobacco, see *Lethum australiense* var. *typicum*.

HY. III VIRUS, see *Hyoscyamus virus* 1.

HYOSCYAMUS VIRUS 1 Hamilton, or Hy. III virus, infects *Hyoscyamus niger*, *Nicotiana tabacum*, *N. glutinosa*, *N. glauca*, *Petunia* sp., *Datura stramonium*, in England.

INTERVEINAL MOSAIC, said to be a combination of tuber-blotch virus and virus X, affects *Solanum tuberosum* in Ireland.

KAT RIVER DISEASE VIRUS, see *Lethum australiense* var. *typicum*.
KROESBLAAR VIRUS, see *Ruga tabaci*.

KROMNEK, see *Lethum australiense* var. *typicum*.

LAKE TITICACA VIRUSES. Viruses found in 48 of 59 varieties of potatoes collected at Lake Titicaca, Peru including *Solanum* viruses 1,4,5,8,9, and 14 and other viruses and virus complexes apparently new. Plants from tubers of ten potato varieties collected in Peruvian native markets in 1940-41 and grown in Sao Paulo, Brazil showed no virus symptoms but four varieties were found to carry viruses, one similar to virus Y and three similar to virus X.

LEAF CURL, NEW FORM ON PETUNIAS IN AFRICA, unlike leaf curl in tobacco, transfers by grafting to *Nicotiana tabacum*, *N. glutinosa* and tomato as well as petunia. Found at Durban Botanical Garden, South Africa.

LEAF CURL OF BEETS AND TOMATOES IN ARGENTINA, is considered by some writers to be caused by the same virus (*Chlorogenus eutetticola* Holmes) which causes sugar-beet curly top and western yellow-blight of tomatoes in the western states. The Argentine virus may occur in Brazil. It is transmitted by *Agallia sticticollis* and apparently is not transmissible by *Eutettix tenellus* which is the vector for *C. eutetticola*.

LEAF CURL VIRUS, see *Ruga tabaci*.

LEAF CURLING OF TOMATOES IN KURSK AND VERONEZH, RUSSIA, causes considerable loss; seed from plants with even the slightest infection produces 100% diseased plants.

LETHUM AUSTRALIENSE var. TYPICUM Holmes, synonyms: -
Lycopersicon virus 3; tomato virus 1; spotted wilt virus;
other possible synonyms include: - Kromnek or Kat River
disease virus; pineapple-yellow-spot virus; pineapple side-
rot virus; *Ananas virus* 1; "black pest" of tomato; "Corcova"
of tobacco in Tucuman (in manual); "vira-caboca" (twisted head)

disease of tobacco in Sao Paulo, Brazil; hunchback of tobacco; tomato ring spot. Hosts and countries reporting one or more of these diseases include *Lycopersicon esculentum*, L. *pimpinellifolium*, *Nicotiana tabacum*, *N. glutinosa*, also *Lactuca sativa* and numerous others, in Australia, British Isles, South Africa, Argentina and the United States. Transmission by thrips in which it must be "incubated" 5 to 9 days has been demonstrated in some cases. Vectors include *Frankliniella insularis*, *F. occidentalis*, *F. moultoni*, *Thrips tabaci*. Quite possibly some of the viruses or strains included here are distinct and not in this country. Seed of tomato varieties bred for resistance to spotted wilt in California was sent to South Africa where over 60% of the plants of each variety became infected with krommeck; even *Lycopersicon pimpinellifolium* showed 20% infection.

LITTLE LEAF OF BRINJAL (EGGPLANT), see *Datura virus 2*.

LYCOPERSICON VIRUS 1, see *Marmor tabaci var. canadense*.

LYCOPERSICON VIRUS 3, see *Lothum australiense var. typicum*.

LYCOPERSICON VIRUS 4, see *Marmor dodecahedron*.

LYCOPERSICON VIRUS 5, see *Galla australiensis*.

LYCOPERSICON VIRUS 6, also known as tomato virus 2, or tomato bunchy top, causes diseases of *Lycopersicon esculentum*, *Physalis viscosa*, *P. peruviana*, *Nicandra physaloides*, *Nicotiana tabacum*, in South Africa. *Petunia hybrida*, *Solanum melongena*, *S. tuberosa* and *Capsicum frutescens* carry the virus without showing any symptoms. *Zinnias* become infected also.

MARMOR ANGLIAE Holmes, synonyms: - *Solanum virus 7*; potato-paracrinkle virus; potato virus E; potato virus Z. May be masked or produce leaf mottling and necrosis in *Solanum tuberosum* and infects *Datura stramonium*, in England.

MARMOR AUCUBA Holmes (in part). Holmes lists as synonyms of *M. aucuba* some diseases later shown by Dykstra and others to be distinct and not in the United States. One of these is now *M. aucuba var. canadense*, q.v.; another (with synonyms: - *Solanum virus 8*; potato aucuba mosaic virus (in part); potato pseudo-net necrosis virus; potato phloem-necrosis virus; potato tuber-blotch virus; Monocraat virus; potato virus F) occurs on *Solanum tuberosum* in Ireland, Netherlands, and Lake Titicaca, Peru, if all reports are correct. The virus in Ireland has been found to include a strain causing top necrosis in potato and differing from other viruses known to cause top necrosis. Koch & Johnson imported and studied this virus, calling it a "potato streak virus." Infected Bliss Triumph and Green Mountain plants developed distinct necrotic streak-like symptoms on leaf veins, laminae and stems, usually resulting in death of the bud and often of the plant. In Ireland, where the strain is called "virulent tuber blotch" to distinguish it from the true tuber blotch, it was found that potatoes infected with true tuber blotch, or with the

strain called potato virus G, would not take virulent tuber blotch. Names applied to the form of the virus in the U. S. include Solanum virus 9; potato virus G; potato aucuba mosaic virus (in part).

MARMOR AUCUBA var. CANADENSE Black & Price, or Canada streak virus, infects Solanum tuberosum, in Canada.

MARMOR DODECAHEDRON Holmes. Synonyms: - Lycopersicon virus 4; tomato bushy-stunt virus; bushy-stunt virus. Apparently important on tomatoes only, in the British Isles, but also infects Nicotiana tabacum, N. glutinosa, N. langsdorfii, Datura stramonium; and Vigna sinensis and Zinnia elegans.

MARMOR DUBIUM var. FLAVUM Holmes, or potato-mottle virus, yellow-mottle strain, gives a yellow cast to diseased potato plants, in Nova Scotia, Canada. Will infect Lycopersicon esculentum and other Solanaceae.

MARMOR LETHALE Holmes, or Nicotiana virus 11, or tobacco-necrosis virus, found on tobacco in greenhouses in England, Scotland, and Australia will infect numerous plants in diverse families, including beets, radishes, cucumbers and beans. In some hosts roots only are infected.

MARMOR TABACI var. AUCUBA Holmes. Synonyms: - Nicotiana virus 1C; tobacco virus 6; tobacco-mosaic virus, tomato aucuba-mosaic strain; aucuba-mosaic virus. This virus isolated and studied in England has been reported from Japan and may occur elsewhere. It will infect tomatoes, tobacco and numerous diverse hosts.

MARMOR TABACI var. CANADENSE Holmes. Synonyms: - Lycopersicon virus 1; tomato virus 4; tobacco-mosaic virus, single virus streak strain; tomato stripe virus; tomato streak virus; glasshouse streak virus; tomato streak virus No. 1. This virus is prevalent in Canada, causing necrotic lesions on stem, leaves and fruit, mottling and stunting of tomato plants. Nicotiana spp., including tobacco, and other Solanaceae become infected. This virus occurs in England and may be one of those reported from Russia and Denmark.

MARMOR TABACI var. DEFOLIANS Holmes. Synonyms: - Nicotiana virus 1A; tobacco-mosaic virus, onion mosaic strain; tomato onion-mosaic virus. This virus will infect Nicotiana glutinosa, N. langsdorfii and Datura stramonium as well as tomatoes and tobacco, in England.

MARMOR TABACI, RING STRAIN ON PEPPERS IN JAPAN. This is considered a distinct ring strain of tobacco mosaic (Nicotiana virus 1.). It produces definite rings on tobacco and a yellow mottling on Physalis angulata and Solanum nigrum. On one variety of pepper (Capsicum frutescens presumably) it produced a large bright yellow mottling on the leaves, in nature. Inoculation of other varieties induced distinct ring or mottle patterns on some varieties and primary local necrotic spots on inoculated leaves only on other varieties. Lesions

and symptoms followed inoculation of some other Solanaceae.

MONOCRAAT VIRUS, see Marmor aucuba (in part).

NICOTIANA VIRUS 1, see Marmor tabaci, ring strain on peppers in Japan.

NICOTIANA VIRUS 1A, see Marmor tabaci var. deformans.

NICOTIANA VIRUS 1C, see Marmor tabaci var. aucuba.

NICOTIANA VIRUS 5 Boning, or tobacco virus 11, or tobacco stripe and curl disease virus, affects Nicotiana tabacum in Bavaria, Germany.

NICOTIANA VIRUS 6 McKinney, or tobacco virus 12, or green mosaic virus, infects Nicotiana tabacum and N. glauca, in Canary Islands.

NICOTIANA VIRUS 9 Jochems, or tobacco virus 17, or tobacco Rotterdam B-disease virus, infects Nicotiana tabacum in Sumatra.

NICOTIANA VIRUS 10, see Ruga tabaci.

NICOTIANA VIRUS 11, see Marmor lethale.

NICOTIANA VIRUS 14, see Annulus bergerac.

NICOTIANA VIRUS 15 Smith was found in a single plant of Nicotiana glutinosa at Cambridge, England.

PEPPER MOSAIC IN PUERTO RICO, apparently distinct from previously known viruses of pepper, causes crop losses of 50 to 60%. Inoculated plants show vein clearing in younger leaves in 10 to 12 days, followed by systemic mottling, and usually by veinbanding later. Leaves become wrinkled and the plant stunted, especially if infected early. Fruits are few, small, distorted. Large Bell Hot shows vein necrosis in 5 or 6 days, then defoliation, stem-streaking, and death. Readily transmissible mechanically and Myzus persicae may be a vector. Only 2 of 84 varieties tested showed any resistance. Nicotiana spp. were successfully inoculated.

PHYSALIS "GIANTISM", PHYSALIS LEAF ROLL, PHYSALIS MOSAIC, and PHYSALIS "STRINGINESS", were all found affecting Physalis angulata in Russia where it is an important crop.

PINEAPPLE SIDE-ROT VIRUS, see Tomato ring spot, and Lethum australiensis var. typicum.

PINEAPPLE-YELLOW-SPOT VIRUS, see Tomato ring spot, and Lethum australiensis var. typicum.

POTATO AUCUBA MOSAIC VIRUS (in part), see Marmor aucuba (in part).

POTATO MOTTLE VIRUS, yellow mottle strain, see Marmor dubium var. flavum.

POTATO-PARACRINKLE VIRUS, see Marmor angliae.

POTATO PHLOEM-NECROSIS virus, see Marmor aucuba (in part).

POTATO PSEUDO-NET NECROSIS VIRUS, see Marmor aucuba (in part).
POTATO STREAK VIRUS, see under Marmor aucuba (in part).

POTATO TUBER-BLOTCH, see Marmor aucuba (in part).
POTATO VIRUS C, see Solanum virus 5.

POTATO VIRUS E, see Marmor angliae.
POTATO VIRUS F, see Marmor aucuba (in part).
POTATO VIRUS G, see Marmor aucuba (in part).

POTATO VIRUS K, is reported by Kohler as an overlooked potato virus in Germany. It seems to be latent in plants in the field unless some other virus infects the host also. In combination with other viruses it causes severe crinkle, sometimes accompanied by stunting. Transmissible by *Myzus persicae* or by grafting but not by mechanical transfer of juice.

POTATO VIRUS X, see Interveinal mosaic and Lake Titicaca viruses.
POTATO VIRUS Y, see Lake Titicaca viruses.
POTATO VIRUS Z, see Marmor angliae.

PURPLE DWARF of POTATO, described as new by Sanford & Clay, occurs rather widely in the southern, central and north-central parts of Alberta, Canada, where it is said to have been present ten years or so. Infection up to 5% but usually not over 1%. General stunting and distortion, with purple color (especially at margins) appearing early, are characteristic under field conditions. Tubers, if any are produced by diseased plants, are not over one inch in diam. and always show severe necrosis. Transmission probably through infected tubers. Tops emerging from infected seed pieces are rigid, brittle, stunted, often dark green, and are likely to die.

RUGA TABACI Holmes. Synonyms: - Nicotiana virus 10; tobacco virus 16; tobacco leaf curl virus; leaf curl virus; tobacco kroepoek virus; tobacco cabbaging or crinkle virus; tobacco crinkly-dwarf virus; kroesblaar virus; gilah virus. This virus causes stunting, discoloration and other abnormal conditions of tobacco plants in Belgian Congo, Gold Coast, India, Java, Madagascar, Nyasaland, Rumania, Sierra Leone, South Africa, Southern Rhodesia, Sumatra, Tanganyika, and Zanzibar. Other species of *Nicotiana*, tomato, and some *Compositae* have been infected. Transmitted by a white fly (*Bemisia gossypiporda*) in part at least. Possibly this species should be divided. (See *Ageratum* virus, which may be mixed strains of this.) Transmitted by *Trialeurodes natalensis* Corbett to a number of hosts in South Africa. Numerous strains of the virus have been studied in South Africa. Virus said to occur in most parts of Africa where tobacco is grown.

SHEATH-CALYX VIRUS, see *Galla australiensis*.

SHORT-TOP VIRUS OF POTATOES IN NEW ZEALAND, will infect *Nicotiana tabacum*, *N. rustica*, *N. glauca*, *Petunia hybrida*, *Datura stramonium*. Said to be transmitted in tubers to some extent at least.

SOLANUM VIRUS C, see *Solanum virus 5*.

SOLANUM VIRUS 1 (in U. S.), see Lake Titicaca viruses.

SOLANUM VIRUS 4 (in U. S.), see Lake Titicaca viruses.

SOLANUM VIRUS 5 Salamon, or Di Vernon streak, or *Solanum virus C*, affects potatoes in England and at Lake Titicaca, Peru.

SOLANUM VIRUS 7, see *Marmor angliae*.

SOLANUM VIRUS 8, see *Marmor aucuba* (in part), and Lake Titicaca viruses.

SOLANUM VIRUS 9, (in U. S.), see *Marmor aucuba* (in part), and Lake Titicaca viruses.

SOLANUM VIRUS 14 (in U. S.), see Lake Titicaca viruses.

SPOTTED WILT VIRUS, see *Lethum australiense* var. *typicum*.

SUGAR-BEET CURLY TOP, see under leaf curl of beets and tomatoes in Argentina.

"STOLBUR", see *Galla australiensis*.

STOWBOOR VIRUS, see *Galla australiensis*.

"STREAK" or "BLACK STRIPE" DISEASE OF TOMATOES IN NEW ZEALAND, may be the same as Tobacco vein-banding necrosis. Apparently unlike diseases prevalent in England and North America.

TOBACCO CABBAGING VIRUS, see *Ruga tabaci*.

TOBACCO CRINKLE VIRUS, see *Ruga tabaci*.

TOBACCO CRINKLY-DWARF VIRUS, see *Ruga tabaci*.

TOBACCO GREEN MOSAIC VIRUS, see *Nicotiana virus 6*.

TOBACCO KROEPOEK VIRUS, see *Ruga tabaci*.

TOBACCO LEAF-CURL VIRUS, see *Ruga tabaci*.

TOBACCO-MOSAIC VIRUS, TOMATO AUCUBA-MOSAIC STRAIN, see *Marmor tabaci* var. *aucuba*.

TOBACCO-MOSAIC VIRUS, ENATION-MOSAIC STRAIN, see *Marmor tabaci* var. *deformans*.

TOBACCO-MOSAIC VIRUS RING STRAIN ON PEPPER IN JAPAN, see *Marmor tabaci*, ring strain.

TOBACCO-MOSAIC VIRUS, SINGLE-VIRUS STREAK STRAIN, see *Marmor tabaci* var. *canadense*.

TOBACCO-MOSAIC VIRUS, TOMATO AUCUBA-MOSAIC STRAIN, see *Marmor tabaci* var. *aucuba*.

- TOBACCO NECROSIS VIRUS, see Marmor lethale.
TOBACCO ROTTERDAM B-DISEASE VIRUS, see Nicotiana virus 9.
TOBACCO STRIPE AND CURL DISEASE VIRUS, see Nicotiana virus 9.
TOBACCO VEIN-BANDING NECROSIS, affecting Nicotiana tabacum in New Zealand may be due to the same virus causing "stripe" or "black stripe" disease of tomatoes. Apparently unlike necrotic diseases of tobacco in other countries.
TOBACCO VIRUS 6, see Marmor tabaci var. aucuba.
- TOBACCO VIRUS 11, see Nicotiana virus 5.
TOBACCO VIRUS 12, see Nicotiana virus 6.
- TOBACCO VIRUS 16, see Ruga tabaci.
TOBACCO VIRUS 17, see Nicotiana virus 9.
- TOMATO BIG-BUD VIRUS, see Galla australiensis.
TOMATO BLUE-TOP VIRUS, see Galla australiensis.
- TOMATO BUNCHY TOP, see Lycopersicon virus 6.
TOMATO BUNCHY-TOP VIRUS, see Galla australiensis.
- TOMATO BUSHY-STUNT VIRUS, see Marmor dodecahedron.
TOMATO ENATION-MOSAIC VIRUS, see Marmor tabaci var. deformans.
- TOMATO FRUIT-WOODINESS VIRUS, see Galla australiensis.
TOMATO RING SPOT. Apparently the same virus affects tomato and pineapple (*Ananas sativus*) and occurs in Hawaii and South Africa. The possible synonyms include tomato spotted-wilt virus, which is in the U. S., and others listed under *Lethum australiense* var. *typicum*.
- TOMATO ROSETTE VIRUS, see Galla australiensis.
TOMATO SPOTTED-WILT VIRUS (in U. S.), see Tomato ring spot.
- TOMATO STREAK VIRUS, see Marmor tabaci var. canadense.
TOMATO STREAK VIRUS NO. 1, see Marmor tabaci var. canadense.
TOMATO STRIPE VIRUS, see Marmor tabaci var. canadense.
- TOMATO VIRUS 1, see *Lethum australiense* var. *typicum*.
TOMATO VIRUS 2, see Lycopersicon virus 6.
TOMATO VIRUS 3, see Galla australiensis.
TOMATO VIRUS 4, see Marmor tabaci var. canadense.
- TUBER-BLOTCH VIRUS, see Intervetinal mosaic, and Marmor aucuba (in part).
TWISTED HEAD OR VIRA-CABECA OF TOBACCO, see *Lethum australiense* var. *typicum*.
- "VIRA-CABECA" of tobacco, see *Lethum australiense* var. *typicum*.
VIRULENT TUBER BLOTCH, see under Marmor aucuba (in part).
- VIRUS X, see Intervetinal mosaic and Lake Titicaca Viruses.
VIRUS Y, see Lake Titicaca Viruses.

YELLOW BLIGHT OF TOMATOES, see under Leaf curl of tomatoes in Argentina.

NECROSIS OF TOBACCO, infects *Nicotiana tabacum* and *N. glauca* in Brazil. Six other species of *Nicotiana* are infected successfully, also *Solanum nodiflorum* and *S. physaloides*. Three stages of the disease are noted; white necrosis; apparent recovery; and, "cabbage-leaved" phase.

YELLOW DWARF OF TOBACCO IN AUSTRALIA, occurs in southern New South Wales, Victoria and South Australia. The disease is sometimes abandoned owing to ravages of the Jassid, *Thamnotettix argentea* (Evans), symptoms showing in a minimum of 10 days. Margins of infected young apical leaves roll under and tips bend down, later the ventral surface appears to be ribbed. The plants become yellowish and dwarfed, the leaves not salable. Root development is reduced. New shoots the following spring, on plants that live over, are diseased.

Insect carriers, vectors, etc. mentioned in these virus disease notes:

AGALLIA STICTICOLLIS, see under Leaf curl of beets and tomatoes in Argentina.

BEMISSIA GOSSYPIPERDA, see under Ruga tabaci.

EMPOASCA DEVASTANS, see under Datura virus 2.

EUTETTIX PHACITIS, see under Datura virus 2.

EUTETTIX TENELLUS, mentioned under Leaf curl of beets and tomatoes in Argentina.

FRANKLINIELLA INSULARIS, see under Lethum australiense var. typicum.

FRANKLINIELLA MOULTONI, see under Lethum australiense var. typicum.

FRANKLINIELLA OCCIDENTALIS, see under Lethum australiense var. typicum.

MYZUS PERSICAE, see under "Blanching."

MYZUS PERSICAE, see under Datura virus 1.

MYZUS PERSICAE, see under Pepper mosaic in P. R.

MYZUS PERSICAE, see under Potato virus K.

THAMNOTETTIX ARGENTATA, see under Yellow dwarf of tobacco.

THRIPS TABACI, see under Lethum australiense var. typicum.

TRIALEURDES HATALENSIS, see under Ruga tabaci.

WHITE FLIES, see under Ageratum virus disease.